ATTACHMENT C

J.R. SIMPLOT PERFORMANCE TEST RESULTS

J.R. SIMPLOT COMPANY P.O. BOX 912 POCATELLO, IDAHO 83204-0912
(208) 232-6620

AGRIBUSINESS

CERTIFIED MAIL 7002 2410 0000 0383 4613

August 21, 2003

Zach Q. Klotovich
State of Idaho
Department of Environmental Quality
1410 North Hilton
Boise, ID 83706-1255

RE: J.R. Simplot Co. – Don Siding Plant – TIER I Operating Permit No. 007-00006 – Appeal Response – Permit Condition 15.14 – SPA – One Time Compliance Test – NOx – Permit Condtion 15.15 – SPA – One Time Compliance Test – CO

Mr. Klotovich:

The J.R. Simplot Company, Don Plant, submits the enclosed compliance test results to demonstrate fulfillment of the requirements set forth at Permit Condition 15.14 and Permit Condition 15.15 in the Tier I Operating Permit issued December 24, 2002. Permit Condition 15.14 states the following:

> The permittee shall either conduct a compliance test to measure NO_x emissions from the SPA primary-control scrubber stack utilizing a pollutant-specific method promulgated by the EPA, a Department-approved alternative, or use the Department's emission estimation methods used in the analysis of the "Extended Absorption Scrubber," PTC No. 077-00006, dated April 17, 1990, to demonstrate compliance with the NO_x limit in Permit Condition 15.2.

Permit Condition 15.15 states the following:

> The permittee shall either conduct a compliance test to measure CO emissions from the SPA primary-control scrubber stack utilizing a pollutant-specific method promulgated by the EPA, a Department-approved alternative, or use the Department's emission estimation methods used in the analysis of the "Extended Absorption Scrubber," PTC No. 077-00006, dated April 17, 1990, to demonstrate compliance with the CO limit in Permit Condition 15.3.

The required compliance tests were conducted on January 17, 1991 and May 2, 1992. Results of those compliance tests were submitted to the Idaho Air Quality Bureau on April 30, 1991 and July 30, 1992 respectively. Copies of the cover letters are enclosed with the compliance test reports. Both compliance tests were conducted to determine

12.01.01
Folder 1-92

Simplot

MINERALS & CHEMICAL DIVISION

J. R. SIMPLOT COMPANY / P.O. BOX 912 / POCATELLO, IDAHO 83204
(208) 232-6620 (PLANT) / (208) 233-7500 (DIVISION OFFICES)

bcc: Norm Self
Dennis Bowman
File

April 30, 1991

bcc (w/o attachment):
Del Butler
Dean Cowley
Jack Cochrane
Earl Mapes
Jim McWilliam
Weaver Stopka
Terry Uhling
Ward Wolleson

Mr. David J. Pisarski, Manager
Monitoring and Compliance Section
Idaho Air Quality Bureau
Division of Environmental Quality
1410 North Hilton, 3rd Floor
Boise, Idaho 83706

Dear Dave,

The accompanying material constitutes the results of air permit compliance monitoring during the first quarter of 1991. The first quarter emission reports of 3-hour data for SO_2, NO_x, and ambient air monitoring are included under this cover. All monitors operated continuously during this period, and there were no instances of excess 3-hour average emissions except for those already reported to the Pocatello field office. For the NO_x report, Table I contains information regarding production and emissions; Table II lists hours of operation and reason for each downtime. The temperature profile on the catalyst was monitored for deterioration during the period.

During this quarter we completed testing on the sources listed below:
1. Superphosphoric Acid plant, extended absorption scrubber: January 17.
2. Nitrogen Solutions (Nitric Acid) plant: February 11.
3. #400 Sulfuric Acid plant: March 1, 8, & 12.

Please note that the testing on #400 Sulfuric Acid represents the completion of the 1990 compliance monitoring we were unable to finish because of adverse weather and other unsuitable conditions. The 1991 compliance testing on this source is scheduled for June 10 - 16. Using the data from this recent test, and the 1990 operating hours previously submitted, we can report that the 1990 SO_2 emissions were 980 Ton/year. The SO_3/Acid mist emissions were 37.1 Ton/year.

The results of weekly opacity observations during this first quarter are included. There were periods of adverse weather which made reliable observations impossible.

Please call me if you have questions on the data, results, or tabulation.

Sincerely,

Norman F. Self
Environmental Control Supervisor
Environmental/Analytical Services

Attachments:

cc: Audrey Cole, IAQB Pocatello
(SO_2 only): Mark Masarik, Region 10 USEPA Boise
(w/o attachment): Kenneth Brooks, Administrator DOE

AIR PERMIT COMPLIANCE TEST REPORT

PLANT NAME: J. R. Simplot Company, Don Plant

LOCATION: Pocatello, Idaho, Hwy 30 W, 3 miles North of City

SOURCE SAMPLED: Superphosphoric Acid Plant, extended absorption scrubber

TESTING COMPANY (if other than plant environmental personnel): _____

CERTIFICATION:

1. Test team leader:

I hereby certify that the test detailed in this report was accomplished in conformance with IDAPA 16.01.1010 (Rules and Regulations for the Control of Air Pollution in Idaho, Sampling and Analytical Procedures) and the Procedures Manual for Air Pollution Control. The results submitted herein are accurate and true to the best of my knowledge.

NAME (print): Dennis C. Bowman

SIGNATURE: Dennis Bowman DATE: 4/30/91

TITLE: Environmental Monitoring Technician

AFFILIATION: Plant Environmental [X] Outside Firm [ ] (see above)

2. Test team report reviewer:

I hereby certify that I have reviewed this report and I find it to be true and accurate, and in conformance with IDAPA 16.01.1010 (Rules and Regulations for the Control of Air Pollution in Idaho, Sampling and Analytical Procedures) and the Procedures Manual for Air Pollution Control, to the best of my knowledge.

NAME (print): Norman F. Self

SIGNATURE: Norman F Self DATE: 4/30/91

TITLE: Environmental Control Supervisor

AFFILIATION: Plant Environmental [X] Outside Firm [ ] (see above)

INTRODUCTION ==========

1. If test purpose was for air permit compliance monitoring, indicate [X], and go to the next section; otherwise explain: _____

2. For the source named on the cover page, give test location(s): _____
The tail gas vent from the final absorber on the extended absorption scrubber.

3. Describe type of process: _____
Treatment of Superphosphoric Acid (SPA) as described in Section 1.1, page 2, of Permit Number 1260-0006 of April 17, 1990.

4. List test date(s): January 17, 1991

5. List parameter(s) tested: NOx

6. List CFR 40 Part 60 Appendix A Methods used: _____
Methods 1,2,3, & 7

7. Were there any deviations from the above Methods ? Yes [X] No [ ] If yes, list Appendix number where deviations are explained: 8

8. Was observer(s) present ? Yes [ ] No [X] If yes, give name(s) and affiliation(s): _____

9. Other information or remarks as needed: _____
Audit samples were run on February 13, 1991, along with samples from testing on Nitrogen Solutions.

SUMMARY OF RESULTS==========

1. List emission results in units of standard for each location specified in INTRODUCTION, Section 1, and for each parameter specified in Section 5.

LOCATION: Tail Gas Vent PARAMETER: NOx
RESULT: Run I 0.048 lb/hr Run II 0.055 lb/hr Run III 0.050 lb/hr
RESULT: Run IV 0.055 lb/hr

2. Result totals/averages as applicable:
Average: 0.052 lb/hr

3. List process data as related to compliance determination:
See Appendix #4. Phosphoric Acid feed rate established at a total of 190 gallons per minute.

4. List permitted emission levels for this source:
0.1lb/hour

5. Visible emission summary for each source listed in Section 1 above:
Visible emission during time of test = 0
See Appendix #2.

6. Quality assurance procedures are listed in Appendix number: 6

7. Discussion of errors:

SOURCE OPERATION==========

1. Description of Process and Control Devices: Operation of process and control devices are as specified in Section 1.1, page 32, of Permit Number 1260-0060 of December 18, 1989; and Section 1.1 & 1.2, page 2, of Permit Number 1260-0006 of April 17, 1990.

2. Process and Control Equipment Flow Diagram is in Appendix 8

3. List process and control device operating parameters during test. See Appendix #4.

4. Were these parameters out of the range of normal operating conditions ? Yes [ ] No [ ] If yes, explain the difference: See Appendix #4.

5. Are raw materials and products during testing the same as those during normal operations ? Yes [X] No [ ] If No, explain the differences:

6. Were there process startups, shutdowns or other operational changes during the tests ? Yes [ ] No [X] If yes, explain these changes and times of start and stop:

SAMPLING AND ANALYSIS PROCEDURES

1. Sample ports are located _>8___ diameters downstream and_>2____ diameters__ upstream from the nearest disturbance.
The stack diameter is__0__feet__3__inches.

2. The sampling train description is tabulated in Appendix 8
Appendix A, Method(s)_1,2,3, & 7

Are there any deviations from these procedures ? Yes [X] No [ ] If Yes, explain the deviations:
Because of the small diameter of the vent, we were unable to obtain a conventional velocity traverse as specified. An electronic flow measuring device was used. Details of this device are provided in Appendix #8.

APPENDIX 1

RESULTS AND CALCULATIONS

CALCULATION OF RESULTS

Diameter of Stack:	3"	Stack temperature:	55°F, 515°R
Area of Stack:	0.049 ft^2	Barometric Pressure:	25.74 "Hg

Airflow calculation using MPM 500e

Readout: 18 meter/sec

$$18\frac{meter}{sec}\times 3.2808\frac{ft}{meter}\times 60\frac{sec}{min}\times .049ft^2 = 174ACFM$$

$$Q_s = 18\frac{meter}{sec}\times 3600\frac{sec}{hour}\times 3.2808\frac{ft}{meter}\times 0.049ft^2\times\frac{528°R}{29.92"Hg}\times\frac{25.74"Hg}{515°R} = 9188\frac{dscf}{hour}$$

Flask Volume Calculation (Using Equation 7-2 in 40CFR Part 60 App A, Method 7)

Measured V_f of flasks from Appendix #6:

Flask #1	2014 ml
Flask #6	1996 ml
Flask #12	1976 ml
Flask #13	1971 ml

V_a in all cases = 25 ml

Initial pressure P_i in all cases:	0.75"Hg
Final pressure P_f in all cases:	25.71"Hg
Initial temperature T_i in all cases:	72°F 532°R
Final temperature T_f in all cases:	72°F 532°R

K_1 = 17.64 °R/"Hg

Run 1, Flask #1:

$$V_{sc} = 17.64\frac{°R}{inHg}\times(2014ml - 25ml)\times\left(\frac{25.71inHg}{532°R} - \frac{0.75inHg}{532°R}\right) = 1646ml$$

Run 2, Flask #6:

$$V_{sc} = 17.64\frac{°R}{inHg}\times(1996ml - 25ml)\times\left(\frac{25.71inHg}{532°R} - \frac{0.75inHg}{532°R}\right) = 1631ml$$

Run 3, Flask #12:

$$V_{sc} = 17.64\frac{°R}{inHg}\times(1976ml - 25ml)\times\left(\frac{25.71inHg}{532°R} - \frac{0.75inHg}{532°R}\right) = 1615ml$$

Run 4, Flask #13:

$$V_{sc} = 17.64\frac{°R}{inHg}\times(1971ml - 25ml)\times\left(\frac{25.71inHg}{532°R} - \frac{0.75inHg}{532°R}\right) = 1610ml$$

CALCULATION OF RESULTS CONTD.

NOx Concentration Calculation (Using Equation 7-4 in 40CFR Part 60 App A, Method 7)

µg NOx from lab results, Appendix #3:

Flask #1 137.56
Flask #6 156.32
Flask #12 140.68
Flask #13 153.19

K_2 = 6.242 (10^{-5}) (lb/scf)/(µg/ml)

$$C = K_2 \times \frac{m}{V_{sc}}$$

Run 1, Flask #1:

$$C = 6.242(10^{-5})\frac{lb/scf}{\mu g/ml} \times \frac{137.56\mu g}{1646ml} = 5.20(10^{-6})\frac{lb}{dscf}$$ 43.5

Run 2, Flask #6:

$$C = 6.242(10^{-5})\frac{lb/scf}{\mu g/ml} \times \frac{156.32\mu g}{1631ml} = 5.98(10^{-6})\frac{lb}{dscf}$$

Run 3, Flask #12:

$$C = 6.242(10^{-5})\frac{lb/scf}{\mu g/ml} \times \frac{140.68\mu g}{1615ml} = 5.44(10^{-6})\frac{lb}{dscf}$$

Run 4, Flask #13:

$$C = 6.242(10^{-5})\frac{lb/scf}{\mu g/ml} \times \frac{153.19\mu g}{1610ml} = 5.94(10^{-6})\frac{lb}{dscf}$$

CALCULATION OF RESULTS CONTD.

NOx Lb/hr Emission Calculation (Using calculated stack flow of 9188 dscf/hour)

Run 1:

$$E = 9188\frac{dscf}{hour} \times 5.20(10^{-6})\frac{lb}{dscf} = 0.0478\frac{lb}{hour}$$

Run 2:

$$E = 9188\frac{dscf}{hour} \times 5.98(10^{-6})\frac{lb}{dscf} = 0.0549\frac{lb}{hour}$$

Run 3:

$$E = 9188\frac{dscf}{hour} \times 5.44(10^{-6})\frac{lb}{dscf} = 0.0500\frac{lb}{hour}$$

Run 4:

$$E = 9188\frac{dscf}{hour} \times 5.94(10^{-6})\frac{lb}{dscf} = 0.0546\frac{lb}{hour}$$

APPENDIX 2

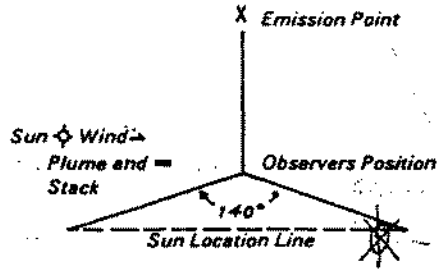
RAW FIELD DATA

IDAHO AIR QUALITY BUREAU
IDHW/DIVISION OF ENVIRONMENT
Visible Emission Observation Form

SOURCE NAME: Superphosphoric Acid Plant	OBSERVATION DATE: 1/17/91
ADDRESS: J.R. SIMPLOT CO. DON PLANT	START TIME: 1:15
P.O. BOX 912 (HWY 30 WEST)	STOP TIME: 1:23
CITY: Pocatello / STATE: ID / ZIP: 83204	
PHONE: 208-232-6620 / SOURCE ID NUMBER:	
PROCESS EQUIPMENT: LSL Oxidation, NO_3 Recovery / OPERATING MODE: Full	
CONTROL EQUIPMENT: final absorber / OPERATING MODE: Full	
DESCRIBE EMISSION POINT: tail gas vent (START / STOP)	
HEIGHT ABOVE GROUND LEVEL: START 30 STOP / HEIGHT RELATIVE TO OBSERVER: START 20 STOP	
DISTANCE FROM OBSERVER: START 50 STOP / DIRECTION FROM OBSERVER: START NE STOP	
DESCRIBE EMISSIONS: none observable (START / STOP)	
EMISSION COLOR: none (START / STOP) / PLUME TYPE CONTINUOUS ☒ FUGITIVE ☐ INTERMITTENT ☐	
WATER DROPLETS PRESENT: NO ☒ YES ☐ / IF WATER DROPLET PLUME: ATTACHED ☐ DETACHED ☐	
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED: START top of vent STOP	
DESCRIBE BACKGROUND: grey sky (START / STOP)	
BACKGROUND COLOR: START dark grey STOP / SKY CONDITIONS: START cloudy STOP	
WIND SPEED: START 10 mph STOP / WIND DIRECTION: START SW STOP	
AMBIENT TEMP: START 30° STOP / WET BULB TEMP. / RH, percent	

SEC / MIN	0	15	30	45	SEC / MIN	0	15	30	45
1					31				
2					32				
3					33				
4					34				
5					35				
6					36				
7					37				
8					38				
9					39				
10					40				
11					41				
12					42				
13					43				
14					44				
15	0	0	0	0	45				
16	0	0	0	0	46				
17	0	0	0	0	47				
18	0	0	0	0	48				
19	0	0	0	0	49				
20	0	0	0	0	50				
21	0	0	0	0	51				
22	0	0	0	0	52				
23					53				
24					54				
25					55				
26					56				
27					57				
28					58				
29					59				
30					60				

Source Layout Sketch — Draw North Arrow



NUMBER OF READINGS ABOVE: 15 % was 0	NUMBER OF MINUTES ABOVE: — % was
AVERAGE OF READINGS ABOVE: — % was 0	RANGE OF READINGS ABOVE: % was to
COMMENTS	OBSERVER'S NAME: Norman F. Self
	OBSERVER'S SIGNATURE: Norman Self / DATE: 1/17/91
I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS / SIGNATURE	CERTIFIED BY / DATE
TITLE / DATE	VERIFIED BY / DATE

EPA METHOD #7 NO_x SAMPLING

LOCATION: Liquid Plant

DATE: 1/17/91 Time

TECHS:

TEST:

OBSERVER:

BAROMETRIC PRESS: Initial 25.74 Final

AMBIENT TEMP:

SAMPLE NO.	FLASH NO.	FLASH VOL (ML)	ABS SOLN VOL (ML)	TIME	LOSS OF VAC OVER ONE MINUTE	INITIAL COND FLASH				FINAL COND FLASH				ΔP @ CENTER POINT
						cm Hg	IN Hg	°F.	°R	cm Hg	IN Hg	°F.	°R	
1	#1	2014	25		0	1.9	.75	52°	532	65.3	25.71	72°	532	
2	#6	1996	25		0	1.9	.75	72	532	65.3	25.71	72	532	
3	#12	1996	25		0	1.9	.75	72	532	65.3	25.71	72	532	
4	#13	1971	25		0	1.9	.75	72	532	65.3	25.71	72	532	

1	6	12	13
45.1	45.1	45.1	45.1
43.2	43.2	43.2	43.2
1.9	1.9	1.9	1.9

1	6	12	13
76.7	76.7	76.7	76.7
76.7	76.7	76.7	76.7
11.4	11.4	11.4	11.4
65.3	65.3	65.3	65.3

LOCATION: Iguid Plant

TEST: METHOD 3 INTIGRATED SAMPLE

DATE: 1/17/91

TECH: Bowman

BAROMETRIC PRESS: 25.74

SAMPLE LOCATION IN STACK PITOT TUBE

Leak Check of equipment ✓

TIME	INDICATED FLOW RATE	TEMP °F. STACK	ΔP PITOT TUBE
1.00	2.0	55	
1:45	2.0	55	

ORSAT ANALYSIS	RUN I	RUN II	RUN III	RUN IV	RUN V
% CO_2					
% O_2					
% CO					

% N by difference

Md (dry molecular weight) lb/lb mole = 0.44 (% CO_2) + 0.32 (% O_2) + 0.23 (% N + % CO)

Md =

Md =

Md =

Liquid Plant Jan 17th, 1991

Because of the size of this duct, (3" Inner diameter) Dennis Bowman and myself used our Solomat MPM 500e hotwire anemometer. The solomat let us Average the airspeed over a 3 minute time period at 3 different locations at both different Cross-section of the duct. The avg. m/s was determined to be 18 meters per second. The cross-section of the duct was at 90°.

John N. Oborn

Environmental Air Quality Technician.

APPENDIX 3

LABORATORY REPORT

Is Chain of Custody applicable ? Yes [ ] No [X] If Yes, chain of custody is attached. If No, explain: __All samples are handled, prepared and analyzed__ only by members of the test team. No transfer is involved.

NO_2 determination from Liquid plant

1/22/

	520 Reading 1	2	Ave
Blank	0.000	0.000	0.000
10 µg	0.004	0.007	0.005
50 µg	~~0.072~~	0.067	0.070	0.0685
100 µg	0.157	0.164	0.1605
150 µg	~~0.244~~ 0.244	0.243	0.2435
200 µg	0.315	0.323	0.319
#1	0.039	~~0.049~~ 0.049	0.044
#6	0.049	0.051	0.050
#12	0.043	0.047	0.045
#13	0.049	0.049	0.049

$K_{11} = 50\ \dfrac{A_1 + A_2 + A_3 + A_4}{A_1^2 + A_2^2 + A_3^2 + A_4^2}$

$= 50\ \dfrac{0.0625 + 2(0.1105) + 3(0.245) + 4(0.319)}{(0.0625)^2 + (0.1635)^2 + (0.245)^2 + (0.319)^2}$

$= 50\ \dfrac{0.0685 + 0.3210 + 0.7305 + 1.276}{0.0047 + 0.0258 + 0.0593 + 0.1018}$

$= 50\left(\dfrac{2.396}{0.1916}\right) = 625.261$

#1 = (625.261)(0.044)(1)(5) = 137.56 µg NO_2

#6 = (625.261)(0.050)(1)(5) = 156.32 µg NO_2

#12 = (=)(0.045)(1)(5) = 140.68 µg NO_2

#13 = (=)(0.049)(1)(5) = 153.19 µg NO_2

James B. Myers
1/22/91

GAS ANALYSIS DATA FORM

PLANT Tyler Plt.

DATE 1/17/91 TEST NO

SAMPLING TIME (24-hr CLOCK) 1100 1300

SAMPLING LOCATION Stack

SAMPLE TYPE (BAG, INTEGRATED, CONTINUOUS) Integrated

ANALYTICAL METHOD Orsat

AMBIENT TEMPERATURE

OPERATOR Bowman

COMMENTS:

RUN / GAS	1		2		3		AVERAGE NET VOLUME	MULTIPLIER	MOLECULAR WEIGHT OF STACK GAS (DRY BASIS) M_d
	ACTUAL READING	NET	ACTUAL READING	NET	ACTUAL READING	NET			
CO_2	.6	.6	.6	.6	.6	.6		44/100	.264
O_2 (NET IS ACTUAL O_2 READING MINUS ACTUAL CO_2 READING)	20.6	20	20.6	20	20.6	20		32/100	6.4
CO (NET IS ACTUAL CO READING MINUS ACTUAL O_2 READING)								28/100	
N_2 (NET IS 100 MINUS ACTUAL CO READING)		79.4		79.4		79.4		28/100	22.232
								TOTAL	28.90

APPENDIX 4

RAW PRODUCTION DATA

I have reviewed the attached log sheets, and I verify that these are the plant operating data, as entered by the operator, during the time of the test.

Name (print): Delbert Butler

Signature: Delbert Butler Date: 4-30-91

Title: Ammo Plus Area Manager

The Liquid Plant Oxidation Unit was stack tested on January 17th from 1:00 pm to 1:45 pm. The plant was operating on 190 gpm of 52% feed during this test. As you review the operating log sheets note the following points of clarification;

* Log sheet information is gathered on two hour increments.
* Even though #2 Evaporator was in operation the 36 gpm feed rate should not be included in the production rate calculation. #2 evap. was producing a specialty product using oxidized acid as its feed stock; therefore, this product would not have been sent through oxidation unit.
* The rates at the Liquid plant were limited the day of the test due to feed supply. As may be noted on the operating log sheet, #1 & #3 evaps. were placed on recycle from 11:30 am till 12:30 pm to conserve on feed for the test. Both were restarted at 12:30 and rates increase to allow testing on the highest possible rate for current conditions. #1 was lined out on a 100 gpm feed rate. #3 ran at 90 gpm. The stack test was performed on a cumulative rate of 190 gpm. Immediately following the test, the rates were again reduced to match the feed supply. At 3:30 pm #3 evap was taken down for wash due to the lack of feed.

Dennis
Here's the info you
requested. If you need
more let me know.
Thanks
Del

J. R. SIMPLOT CO. ---- LIQUID PLANT

DATE: 1/10/91

EVAPORATOR ONE

TIME	PRESSURE: VACUUM	PRESSURE: RECYCLE PUMP OUTLET	PRESSURE: STEAM CHEST	PRESSURE: STEAM VALVE POSITION	FLOW: EVAPORATOR FEED	FLOW: SURFACE CONDENSER	FLOW: FLUORINE SCRUBBER	FLOW: DESUPER HEATER	TEMPERATURE: ABOVE HEATER	TEMPERATURE: BELOW HEATER	TEMPERATURE: STEAM CHEST	TEMPERATURE: SURFACE COND. IN	TEMPERATURE: SURFACE COND. OUT	AMPERE: RECYCLE PUMP	AMPERE: VACUUM PUMP	AMPERE: PRODUCT PUMP	AMPERE: FEED ACID PUMP
2400	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
0200	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
0400	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
0600	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
0800	23	13.5	230	3/4	60		1.	29	391	325	428	110	97	175	32	5	7.
1000	22.5	14.5	230	3/4	90		1.	31	372	[illegible]	[illegible]	137	[illegible]	175	44	6	15
1200	21.5	[illegible]	246	3/4	90												
1400	21.5	13.1	246	3/4	85		1.	31	377	[illegible]	440	136	111	175	31	6	7.5
1600	21.5	12.9	[illegible]	3/4	85		1	31	[illegible]	[illegible]	[illegible]	[illegible]	103	[illegible]	31	7.3	7.6
1800	21.0	[illegible]	[illegible]	[illegible]	85		1	31	[illegible]	326	[illegible]	128	108	[illegible]	37	[illegible]	[illegible]
2000	[illegible]	[illegible]	[illegible]	[illegible]	86		1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
2200	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

EVAPORATOR TWO

TIME	MISC.: VACUUM	MISC.: EVAPORATOR FEED	MISC.: SURFACE CONDENSER	MISC.: DESUPER HEATER	MISC.: RECYCLE PUMP	MISC.: PRODUCT PUMP	TEMP: ABOVE HEATER	TEMP: BELOW HEATER	TEMP: STEAM CHEST	TEMP: SURFACE CONDENSER
2400										
0200		[illegible]								
0400	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
0600	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
0800	21.5	[illegible]			22	5	392	384	[illegible]	176
1000	21.5	[illegible]			20	5	385	377	442	[illegible]
1200	21.5	[illegible]			20	5	[illegible]	365	447	[illegible]
1400	22	[illegible]			26	5	372	[illegible]	[illegible]	225
1600	22	[illegible]			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1800	22	[illegible]			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
2000	[illegible]	[illegible]			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
2200	[illegible]	[illegible]			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

EVAPORATOR THREE

TIME	PRESSURE: VACUUM	PRESSURE: RECYCLE PUMP OUTLET	PRESSURE: STEAM CHEST	PRESSURE: STEAM VALVE POSITION	FLOW: EVAPORATOR FEED	FLOW: SURFACE CONDENSER	FLOW: FLUORINE SCRUBBER	FLOW: DESUPER HEATER	TEMPERATURE: ABOVE HEATER	TEMPERATURE: BELOW HEATER	TEMPERATURE: STEAM CHEST	TEMPERATURE: SURFACE COND. IN	TEMPERATURE: SURFACE COND. OUT	AMPERE: RECYCLE PUMP	AMPERE: VACUUM PUMP	AMPERE: PRODUCT PUMP	AMPERE: FEED ACID PUMP
2400	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
0200	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
0400	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
0600	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
0800	219	Not working	66	51	60	180	4.5	17	330	326	[illegible]	125	119	[illegible]	32	4	7
1000	[illegible]		64	74	70	110	6	17	374	371	437	133	130	[illegible]	32	4	7
1200	[illegible]		64	70	70	[illegible]	6	17	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	7
1400	211		65	72	76	180	5.5	15	386	353	[illegible]	120	123	[illegible]	32	4	7
1600	11.6		6.0	70													
1800	[illegible]		[illegible]	[illegible]													
2000																	
2200																	

EAST TOWER / WEST TOWER / STORAGE

TIME	EAST TOWER AMPERE: EAST PUMP	EAST TOWER AMPERE: WEST PUMP	EAST TOWER AMPERE: TOWER FAN	EAST TOWER MISC.: CHLORINE FEED	EAST TOWER MISC.: TOWER PH	EAST TOWER MISC.: TEMPERATURE OUT	EAST TOWER MISC.: BLOWDOWN GPM	WEST TOWER AMPERE: NORTH PUMP	WEST TOWER AMPERE: CENTRAL PUMP	WEST TOWER AMPERE: SOUTH PUMP	WEST TOWER AMPERE: TOWER FAN	WEST TOWER MISC.: CHLORINE FEED	WEST TOWER MISC.: TOWER PH	WEST TOWER MISC.: TEMPERATURE OUT	CONDENSATE CONDUCTIVITY	CONDENSATE PH	STORAGE TEMPERATURE: #1 TANK	#2 TANK	#3 TANK	#4 TANK	#5 TANK
2400			[illegible]			[illegible]				[illegible]	[illegible]			[illegible]						[illegible]	
0200			[illegible]	[illegible]	[illegible]	[illegible]				[illegible]	[illegible]	[illegible]	[illegible]	[illegible]						[illegible]	
0400			[illegible]	[illegible]	[illegible]	[illegible]				[illegible]	[illegible]	[illegible]	[illegible]	[illegible]						[illegible]	
0600			[illegible]	[illegible]	[illegible]	[illegible]				[illegible]	[illegible]	[illegible]	[illegible]	[illegible]						[illegible]	
0800			36	75	6.8	72				90	82	73	10	57						186	
1000			30	75	7	74				90	80	75	9	58						189	
1200			30	75	7.	74				90	80	75	9.2	58						189	
1400			36	75	7	73				90	80	75	9.2	61						190	
1600			32	75	7.2	74				90	82	75	9.	61						[illegible]	
1800			[illegible]	75	7.5	77				[illegible]	[illegible]	75	[illegible]	60						[illegible]	
2000			[illegible]	75	[illegible]	[illegible]				[illegible]	[illegible]	[illegible]	[illegible]	[illegible]						[illegible]	
2200			[illegible]	75	[illegible]	[illegible]				[illegible]	[illegible]	[illegible]	[illegible]	[illegible]						[illegible]	

EVAP #1

ANALYSIS	TOTAL	POLY
SHIFT 1	[illegible]	46.6
SHIFT 2	69.0	27.6
SHIFT 3	69.2	31.3

EVAP #2

ANALYSIS	TOTAL	POLY	P/F	F
SHIFT 1	[illegible]	[illegible]	[illegible]	[illegible]
SHIFT 2	[illegible]	[illegible]	[illegible]	[illegible]
SHIFT 3	[illegible]	[illegible]	[illegible]	[illegible]

EVAP #3

ANALYSIS	TOTAL	POLY
SHIFT 1	69.2	27.2
SHIFT 2	[illegible]	
SHIFT 3	69.0	27.7

EAST TOWER / WEST TOWER ANALYSIS

	CALC HARD 500/800	ALK 50/200	COND 1800/2500	ZINC .5/1.0	CALC HARD 500/800	ALK 50/200	COND 1800/2500	ZINC .5/1.0
SHIFT 1								
SHIFT 2								
SHIFT 3.								

INVENTORY	ANALYSIS	
#1 TANK		
#2 TANK	187	
#3 TANK		
#4 TANK	190 / [illegible]	
#5 TANK		
E. 10-34		
W. 10-34		

SHIFT	1	2	3
SODA ASH			

STEAM

FEED ACID	SP. GR.
SHIFT 1	1.604
SHIFT 2	
SHIFT 3	

OPERATOR: [illegible] SHIFT 1

[illegible]

OPERATOR: [illegible] SHIFT 2

#1 [illegible] at 1130 [illegible]

3 [illegible] @ 1930 →

OPERATOR: [illegible] #3 [illegible] @ 3:30; [illegible] @ 5:30 SHIFT 3

J. R. SIMPLOT CO. — L JID PLANT FILTER

DATE: 1 17-91

#1 FILTER						#2 FILTER						#3 FILTER						#4 FILTER						TIME	AMPERES														TEMPS.				SP. GR.		ANALYSIS
CLEAR / CLOUDY	CYCLE TIME	SERVICE PRESSURE	CAKE THICKNESS	CYCLE GALLONS		TIME START	CLEAR / CLOUDY	CYCLE TIME	SERVICE PRESSURE	CAKE THICKNESS	CYCLE GALLONS	TIME START	CLEAR / CLOUDY	CYCLE TIME	SERVICE PRESSURE	CAKE THICKNESS	CYCLE GALLONS	TIME START	CLEAR / CLOUDY	CYCLE TIME	SERVICE PRESSURE	CAKE THICKNESS	CYCLE GALLONS		FILTER RECYCLE	#2 RECYCLE	REPULP RECYCLE	EAST FILTER FEED	WEST FILTER FEED	NORTH FILTER FEED	W. AGING TANK MIXER	REPULP MIXER	E. AGING TANK MIXER	FILTER FEED TK. MIXER	AGING COOLER PUMP	EMF	3	4	FILTER FEED TANK	WEST AGING TANK	EAST AGING TANK	NE	REPULP DAY TANK	REPULP STORAGE TANK	W.AGING
																																													TOTAL / POLY
																																													FLTR. FEED
																																													TOTAL / POLY
																																													REPULP GALLONS TRANSFERED
																								2400		2	5	16		15	23	20	20	15	40		15	18	220		245	20	1600	1540	TSP
																								0100		2	5	16		15	23	20	20					3	20	3	220	20	1600	1540	
																								0200				16		15		20						5	20			20	1600		AP #1
																								0300				16		15		20							20		1385	20	16		
																								0400				16		15									20		1385	20	16		AP #2
																								0500		21	5	16		15									20		1385	20	16		
																								0600		21	5	16		15									20		1385	20	16		
																								0700																					
dc	120	53	5/8	5107		10:00	dc	120	W	5/8	5557	8:57	dc	120	56	1/2	4359	9:30	dc	120	58	1/2	5612	0800	EMP	25	45	16	—	15	24	23	21	12	38	880	15	18	220	377	386	19	1620	1593	TSP
dc	120	54	5/8	5107		10:00	dc	120	W	5/8	4299	11:35	dc	120	56	3/4	5313							0900	—	25	45	16	—	15	24	23	21	12	38	—	15	18	220	377	386	19	1620	1593	
dc	120	53	5/8	5796								2:21	dc	120	56	3/4	5669				54	5/8	4222	1000	—	25	45	16	—	15	24	23	21	12	38	900	15	18	220	377	386	19	1620	1593	AP #1
																								1100	—	—	5	16	16	15	23	22	20	13	39	—	15	19	210	376	393	19	1630	1595	
																								1200	—	—	5	16	16	15	23	22	20	13	39	900	15	19	207	376	—	—	1620	1583	AP #2
																								1300	—	—	5	16	K	15	23	22	20	13	39	—	15	19	240	377	397	17	1620	1593	
																								1400	—	—	5	16	—	15	23	22	20	13	39	905	15	19	220	378	393	19	1620	1593	
																								1500	—	—	5	16	16	15	23	22	20	13	39	—	16	18	220	378	394	19	1620	1593	
dc	120	54	5/8	3769		7:45	dc	120	60	5/8	3336	5:28	dc	120	56	5/8	4547	5:45	dc	120	56	5/8	3630	1600	—	—	5.5	15	17	15	24	22	20	13	38		17	19	207	377	389	19	1630	1600	TSP
dc	120	54	5/8	3852		7:55	dc	120	60	5/8	3551	11:00	dc	120	56			10:10	dc	120	56			1700	—	—	5.5	15	17	15	24	22	20	13	38	—	17	19	207	377	389	19	1630	1600	
																								1800	—	—	5.5	15	17	15	24	22	20	13	38		17	19	207	377	389	19	1630	1600	AP #1
																								1900	—	30	5.5	15	17	15	24	22	20	13	38	—	17	19	207	377	389	19	1630	1600	
																								2000	—	30	5.5	15	17	—	24	22	20	13	38	891	17	19	207	377	389	19	1630	1600	AP #2
																								2100	—	30	5.5	15	17	—	24	22	20	13	38	—	17	19	214	378	394	19	1630	1600	
																								2200	—	30	5.5	15	17	—	24	22	20	13	38	876	17	19	220	377	389	19	1630	1600	
																								2300	20	30	5.5	—	—	15	24	22	20	13	38	—	17	19	214	377	389	19	1630	1600	

TOR SHIFT 1 | OPERATOR L. Rue | SHIFT 2 | OPERATOR Harding | SHIFT 3

LEVELS				LEVELS				LEVELS			
TK.		REPULP DAY TK.		HPA 1593				1620			
TK.		REPULP STG. TK.		E. AGE TK.	FULL	REPULP DAY TK.	3'	E. AGE TK.	F	REPULP DAY TK.	4' 6"
ENTS:				W. AGE TK.	FULL	REPULP STG. TK.	5'	W. AGE TK.	F	REPULP STG. TK.	5' 10"
				COMMENTS:				COMMENTS:			

APPENDIX 5

TEST LOG

There will be no entries in this section

APPENDIX 6

CALIBRATION AND

QUALITY ASSURANCE

PROCEDURES/RESULTS

Calibration of Lab Barometer

1/14/91

The Barometer in the Lab is located at a elevation of 4,154 ft. above Sea Level.

The Barometer at the YS Weather station is at the same elevation 4,154 ft.

Results.

Lab	USWS
25.54	25.541

Denis

APPENDIX 7

PROJECT PARTICIPANTS

1. Dennis C. Bowman, Environmental Monitoring Technician
2. John N. Oborn, Environmental Monitoring Technician
3. Nadeen B. Myers, Analytical Chemist
4. Norman F. Self, Environmental Control Supervisor
5. E. Dewayne King, Assistant Environmental Analyst

APPENDIX 8

ADDITIONAL INFORMATION

1. Process Flow Diagram

2. Method 7 Sample Train

3. Sample Point Description

4. Special Flow Measuring Device Description

5.

IL GAS ATMOS.
02

9.73
2.00
0.67
0.09

12.51
75
79
100
12.5
30.7

FORM DWG. #: DON\8800\8800A100.DWG (BLOCK=SYM250)

PROJ. NO.: 913-0909-3956	W. O. NO.: F3956	C.I.P. NO.: 5-S-88069

Simplot

MINERALS & CHEMICAL DIVISION POCATELLO, IDAHO

SUPERPHOSPHORIC ACID
LSL OXIDATION SYSTEM
NITRIC ACID RECOVERY
FLOW SHEET 1333 TPD LSL

	2/20/90	
NNER	2/22/90	

CAD DWG. #: J019002C

130-7260-102 H

SCALE: NON

REVISION D

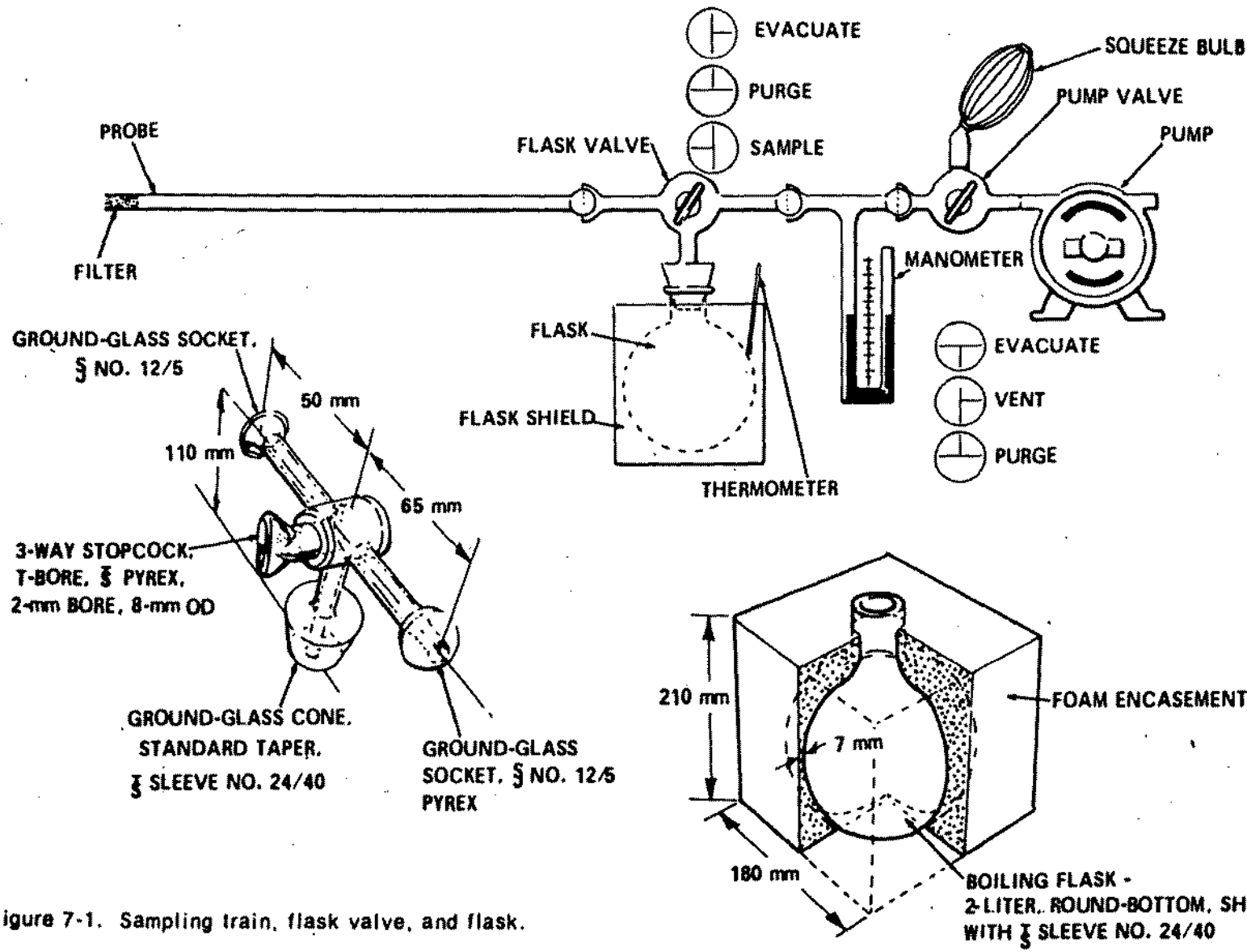


Figure 7-1. Sampling train, flask valve, and flask.

DESCRIPTION OF SAMPLING POINT

Stack inner diameter:	3 inches
Number of traverse points:	Not Applicable for Method #7
	1 inch diameter to admit glass sample probe

MPM 500e

INTRODUCTION

Congratulations on purchasing your MPM 500e, the world's most advanced multi-functional instrument. This unique instrument measures temperature, humidity, airspeed, pressure and RPM; all in one unit. The 500e is simple to use, but please carefully read these instructions to ensure that you are obtaining the full accuracy and versatility from your instrument. The quick reference manual will get you started, but this manual tells the complete story.

The first four sections of this Manual explain correct usage of the 500e, while sections 5 to 10 guide you through the various measurements. Finally, sections 11, 12 and 13 outline the accessories, specifications and recalibration/ servicing facilities.

Contents

1 CONTROLS AND CONNECTORS

The 500e instrument is shown in Figures 1 and 2. The various controls and connectors are described below.

1) **ON/OFF:** The slide switch for turning the instrument ON is located on the front face of the MPM.

2) **FUNCTION SELECT:** The blue rotary switch at the top of the front face selects the measurement. You then choose the engineering unit for that measurement by pressing the SYMBOL switch.

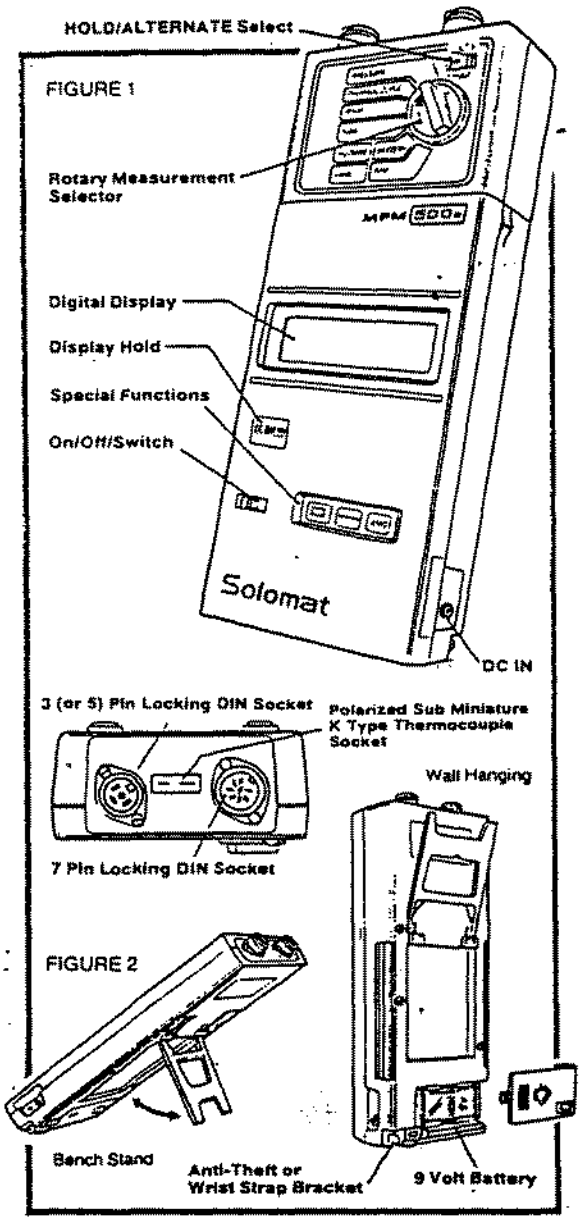
3) **ALTERNATE/HOLD:** The slide switch just above the rotary switch lets you choose either single or two channel measurement. In the HOLD position, the 500e will continuously monitor the measurement selected on the rotary switch. In the ALTERNATE mode, the 500e will first read the measurement selected by the rotary switch, then the temperature (this function is meaningless if the rotary switch is in the 'temperature' position). When measuring pressure, RPM, humidity or airspeed (hot wire), the 500e is expecting a Pt 100 for the temperature measurement. However, when measuring airspeed with a vane anenometer, the 500e is expecting a thermocouple probe. The ALTERNATE mode is designed for unattended monitoring, and in this mode both temperature and the selected measurement can be averaged; plus, the minimum and maximum readings will be automatically updated for both measurements.

4) **MIN/MAX:** The 500e continuously updates the minimum and maximum readings whenever the instrument is ON. The 500e stores minimum and maximum readings for each separate function, so you can check the minimum and maximum values of readings from several connected probes.

   When you first press MIN/MAX, the minimum temperature will be displayed. Press MIN/MAX again, and the maximum temperature will be displayed. As you continue to press the MIN/MAX switch, the display will alternate between MIN and MAX. Press the SYMBOL switch, and the display will then display humidity, followed by airspeed/RPM, then pressure.

   To clear the MIN and MAX memories, press MIN/MAX and HOLD simultaneously. For further information on MIN and MAX readings, refer to Section 4.2.

5) **SYMBOLS:** The SYMBOL push switch allows you to change the engineering units for a given measurement. For example, if you are reading temperature, then pressing the SYMBOL switch will change the display



from Celsius to Fahrenheit. Likewise, when measuring pressure you can change from Pascals to PSI, etc. A full table of these engineering units is listed in Section 4.4.

The SYMBOL function is also used when displaying MIN/MAX and AVERAGE readings. Since the 500e remembers both the minimum and maximum readings for all the different measurements, you may use the SYMBOL switch to cycle through the different measurements. Likewise, in two channel (ALTERNATE) mode, the 500e stores the average of temperature and one other measurement; again, the SYMBOL switch allows you to display both measurement averages.

Plus, if you press the SYMBOL switch when the 500e is first switched ON, the 500e will test the entire liquid crystal display, including all symbols.

6) **AVERAGE:** When the AVERAGE switch is first pressed, the MPM continues to display the current reading of the selected function. However, the AVG symbol will flash, reminding you that the measurements are being added together.

Press the AVERAGE switch a second time, and the 500e will calculate the average of all the readings since the switch was first pressed. The average will be displayed, and the AVG symbol will stop flashing.

If you have been averaging in the 'ALTERNATE' mode, then press the SYMBOL switch and the MPM will display the temperature average as well.

Press the AVERAGE switch a third time, and the display reverts to the current reading, and will continue to average, including the previous readings since you started averaging. Press the AVG and HOLD buttons together, and the 500e will clear the average memories and revert to normal mode.

To give facilities for both short term and long term averaging, the AVERAGE feature also includes a 'slow' option. If you simultaneously press the HOLD and AVG switches, the 500e will operate in the 'slow average' mode. In this mode each block of 32 readings are separately averaged, then added to the AVG memory. This feature increases the averaging time before overflow by 32 times. The AVG symbol flashes ON after every four readings: this is slower than than the normal AVG mode. WARNING: if you try to finish averaging before the 500e has made its first 32 readings, then the display will show 'oooo'. Also, when you stop averaging, the last uncompleted block of 32 readings is ignored.

7) **HOLD:** A 'push to hold display' switch is mounted flush to the front face of the instrument, just below the LCD. This HOLD switch has two functions:

Press the HOLD switch at any time, and the current reading is held. This switch is useful when making a measurement where you must concentrate on the probe, and not the display. The display reverts to the current reading as soon as the switch is released.

The HOLD switch is also used in conjunction with the special features switches:

i) Press the HOLD together with MIN/MAX: all minimum/maximum readings will be cleared from the memory, and the display will revert to normal mode.

ii) Press the HOLD together with the AVG: the 500e will be in the 'slow average' mode for the first switch closure. Press the HOLD and AVG together on the third switch closure, and the 500e will clear the AVERAGE memories and revert to normal mode.

iii) Press the HOLD switch when selecting a measurement with the rotary knob: the 500e will be in the 'secondary function' mode. For more information refer to Section 10.

8) **DIGITAL DISPLAY:** The LCD (Liquid Crystal Display) is shown in Figure 3. This LCD is a custom design and includes: 4½ digit display, polarity, low battery indication, decimal points, special functions indications and engineering units. This LCD is controlled by the Solomat microprocessor with the following features:

i) At turn-on, the display reads 18888, ensuring that all segments are operating correctly. The decimal points also sequentially appear. If the SYMBOL switch was pressed at turn-on, then all engineering units will also be displayed.

ii) The display will 'autorange' (i.e. rescale itself) if the displayed value is greater than 19999. The decimal point is also automatically corrected.

iii) If you check a minimum, maximum or average memory space that has not been used, then the display will show 'oooo'.

iv) If the 500e is receiving wrong inputs, (typically either open or short circuit) then the display will flash 'oooo'. A negative sign means short circuit, and no polarity symbol means open circuit.

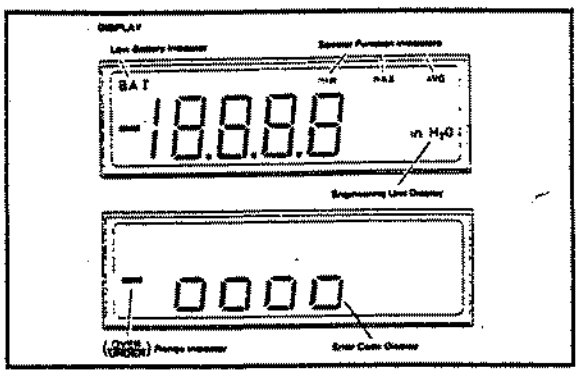


Figure 3. MPM 500 display modes.

9) **STAND:** Referring to Figures 1 and 2, there is a stand built into the 500e case. The stand tilts the instrument at a 30° angle for bench use as shown in Figure 1. The stand can also be removed from the instrument by squeezing the stand legs, then reinserted into the second set of holes for hanging the instrument on the wall as shown in Figure 2.

10) **BATTERY:** The battery lid is removed by firmly pressing down on the left end and sliding in the direction of the arrow (Figure 2). The battery compartment holds a 9 volt alkaline battery. The battery will typically give between 12 and 25 hours of continuous use, depending on which measurement is being made. The BAT symbol on the LCD will appear when you have about four hours of battery life remaining. Also, the battery voltage can be checked by selecting the BAT function on the rotary switch and pressing the SYMBOL switch until the battery voltage appears. This measurement is a more accurate way of judging remaining battery life.

11) **DC IN:** A 2.5mm jack socket is located on the bottom right corner of the 500e, labelled DC IN. The Solomat AC adaptors (AA1 and AA2) plug into this socket to provide continuous powering to the 500e for long term monitoring. The 9 volt battery is automatically disconnected when the 500e is powered through the DC IN socket.

12) **ANTI THEFT/WRIST STRAP:** The stainless steel bracket at the bottom right of 500e (Figure 1) accommodates either the optional stainless steel anti theft cable (AT1) or the optional wrist strap (WS1).

13) **SOCKETS:** There are three sockets at the top of the 500e for accepting various probes.
   i) The yellow socket is a Type K (Chromel Alumel) polarized sub-miniature thermocouple socket. This industry standard socket will accept all Solomat thermocouple probes, as well as thermocouple probes from many other manufacturers.
   ii) The left hand socket is a 3-pin locking DIN socket for use with Solomat Pt 100 temperature probes.
   iii) The right hand socket is a 7-pin locking DIN socket. This socket accepts the following probes: humidity, airspeed (vane and hot wire), RPM, and pressure.

2 WHEN YOU FIRST RECEIVE YOUR INSTRUMENT

Remove the 500e probes and any accessories from the packaging. Check that the contents have arrived in good condition. If the battery has been shipped separately, install the 9-volt battery as shown in Figure 2.
Switch the 500e ON and the instrument will test itself by displaying all the digit segments: 18888 and step through the decimal points. The BAT symbol will also momentarily appear. If the segments do not appear then replace the battery. If you have not plugged a probe into the MPM 500e then after self-test the display will start flashing 'oooo'.

2.1 Checking the MPM 500e

Correct use of the different probes requires that you read the appropriate section of this Manual for that probe. However, to acquaint yourself with the 500e try using the thermocouple temperature probe (this is usually the 205S surface probe). Push the thermocouple plug into the yellow socket of the 500e, then select 'Thermocouple' on the rotary switch, choosing either °C or °F calibration with the SYMBOL switch.

The special function push switches are easy to use. First try HOLD: the display will not change so long as you press this switch. Release this switch and the display will revert to showing the current temperature reading (normal mode). We will now measure the temperature of a room, watching how the minimum, maximum and average functions can be used simultaneously.

1) Clear the minimum and maximum memories by pressing the MIN/MAX and HOLD switches simultaneously.

2) Start averaging the temperature readings by pressing the AVG switch. The flashing AVG symbol reminds you that although the displayed temperature is the current temperature, all readings are being added together in the processor for later calculation of the average temperature.

3) Now walk around the room, measuring the temperature in corners, on radiators, near the windows and doors.

4) When you have finished your tour, press the AVG switch again. The AVG symbol will stop flashing and the average temperature will be calculated and displayed. Press the AVG switch and HOLD switch together, and the average memory will be cleared and the display will return to the normal (current reading) mode.

5) Press the MIN/MAX switch and the minimum temperature will appear. Press this switch again and the maximum temperature will appear. As you continue to press this switch the display will alternate between minimum and maximum. To clear the minimum and maximum memories, press MIN/MAX and HOLD simultaneously. To return to the normal mode without clearing memory, press SYMBOL switch several times as you cycle through all of the MIN and MAX memories, until the MIN and MAX symbols no longer appear, and the instrument has returned to 'normal mode'.

The battery voltage can be checked very easily; select 'BAT' on the rotary functional selector and press the SYMBOL switch twice, stepping through the two airspeed calibrations until the display shows the battery voltage. This battery voltage is usually between 7 and 8 Volts, but decreases as the battery becomes depleted and changes with the ambient temperature.

2.2 Checking the Probes

To ensure that your probes are operating correctly, follow the checkout procedure below.

Pressure: Plug the pressure probe into the 7-pin DIN socket. Select 'pressure' on the rotary function selector. The display should read approximately zero. Turn the 'zero adjust' on the pressure probe and you should be able to set the display to exactly zero. If you have a high pressure probe (512 HP)then you must depress the HOLD switch as you select the pressure function on the rotary selector. If the display shows an error code, or if the display does not change when you move the 'zero adjust', then either the pressure probe or the MPM 500e is not functioning correctly (see Service Section).

Pt 100: If you have purchased a hygrometer probe, it includes a built-in Pt 100 temperature sensor. Plug the hygrometer probe into the 7-pin DIN socket and select 'Pt 100' on the rotary function selector. The 500e should display the ambient temperature. If you have purchased a Pt 100 temperature probe, then plug the probe into the 3-pin DIN socket and you should read the ambient temperature. (NOTE: Do NOT attempt to use a separate Pt 100 at the same time that a hygrometer probe is plugged into the 7-pin DIN socket; the two sensors will be linked in parallel, and the 500e will display an error code "--oooo"). A positive error code would show an open circuit in the probe (see Service Section).

% RH: Plug your hygrometer probe into the 7-pin DIN socket and select '%RH' on the rotary function selector. The 500e will then display the relative humidity in the room: most 'comfortable' rooms are between 30% and 70% RH. If the displayed relative humidity is unreliable or if it is reading the error code then check the calibration of the probe (see humidity calibration, Section 8.3). Press the SYMBOL switch, and the 500e will calculate and display the dewpoint temperature. Press the SYMBOL again and the dewpoint temperature will change between Celsius and Fahrenheit.

Hot Wire (Air Speed):

> WARNING: HOT WIRE PROBES ARE FRAGILE AND MUST BE HANDLED CAREFULLY! REPORT IMMEDIATELY ANY DAMAGE TO THE PROBE WHEN YOU RECEIVE IT. IF YOU DO NOT IMMEDIATELY INFORM SOLOMAT OF ANY TRANSIT DAMAGE, YOU WILL BE LIABLE FOR THE COST OF REPAIR.

Plug the hot wire DIN plug into the 7-pin DIN socket of the 500e. Wave the probe in still air and the 500e should read between 0.5 and 10 m/sec (10--2,000 ft/min), depending on how fast you wave the probe. If the display shows the error code stays at 0 m/sec (or 0 ft/min) or displays an impossible airspeed then refer to the Service Section.

Vane (Air Speed): Plug the vane probe into the 7-pin DIN socket and select 'vane' on the rotary function selector of the 500e. Blow on the vane and the 500e should display between 3 and 15 m/sec, depending on how hard you blow. If the 500e shows an error code then either the probe or the 500e is not functioning correctly (see Service Section).

RPM: To correctly check your tachometer follow the instructions for measuring RPM in Section 6.

3 POWERING THE 500e

The 500e may be powered by either a 9 volt alkaline battery or an AC adaptor (supplied by Solomat).

3.1 Battery Operation

The MPM 500e is powered by a single 9 volt (size PP3/IEC No. 6LR61) alkaline battery. The MPM 500e is supplied with an alkaline battery, and you must replace this battery with another alkaline battery ONLY. An alkaline battery gives you much longer battery life and is safer to use than ordinary zinc carbon batteries.

To Replace the Battery: Remove the battery compartment by pushing down on the arrow, and sliding the plate away from the MPM 500e. Replace the used battery with a new alkaline 9 volt battery, observing proper polarity. Then replace the battery plate, pushing firmly until you hear the plate 'click' into place.

Warning: DO NOT throw used batteries on to a fire. Do not use or store alkaline batteries above 50°C (120°F) or below −20°C (−5°F).

Low Battery: This is indicated by the 'BAT' symbol in the upper left corner of the display. The amount of usable time depends on which probe is being used. With most measurements, you will have about four hours of usage the BAT symbol turns on. The hot wire and RPM probes use more power, and typical use after the BAT symbol appears is 1 hour.

Battery Life: The expected battery life depends on which measurement you are taking. Some probes take a negligible current; thermocouple, Pt 100, %RH, vane. The hot wire and tachometer probes, however, take a significant current and therefore you should expect reduced battery life when using these probes.

Table 1. Alkaline battery part numbers.

Ever Ready	6LF22	Duracell	MN1604
Hellesens	MN1604	Saft	K622
Mazda	LK622	National	6AM6
Ray-o-Vac	AC3	Toshiba	AM6
Ucar	522	Vidor	PP3
Varta	4022	Wonder	KLR22

Table 2. % Remaining battery life for different alkaline battery voltages at five ambient temperatures.

V BATT	0°C 32°F	10°C 50°F	20°C 68°F	40°C 105°F	55°C 130°F
9.0	65%	80	100	110	115
8.5	65	80	97	92	95
8.25	60	75	90	90	90
8.0	55	65	80	75	75
7.75	50	55	60	55	55
7.5	40	35	30	30	30
7.25	30	25	20	15	15
7.0	0	0	0	0	0

Thermocouple, Pt 100, Humidity, Vane: 25 hours (typical)
RPM: 12 hours (typical)
Hot Wire: 4–15 hours (typical: depends on airspeed).
The actual lifetime of a battery also depends on ambient temperature. At elevated temperatures the battery life is shortened. Below is a list of different manufacturers' part numbers for the 9 volt battery (IEC No. 6LR61).

If you require long term portable use from the MPM 500e, we recommend using a 9 volt sealed lead acid battery, and powering the MPM 500e through the DC IN socket, with a 2.5mm jack plug.

The battery voltage can be easily checked at any time by selecting BAT on the rotary function selector and pressing the SYMBOL switch twice until the battery voltage appears.

Table 2 lists the typical remaining battery life for an alkaline 9 volt battery at several temperatures.

NOTE: Alkaline battery voltages often recover by as much as +0.4 volts if the 500e is switched OFF for a time. However, this voltage will drop rapidly after the first 2–3 minutes of use. Therefore, it is best to wait a couple of minutes after turning the 500e ON before checking battery voltage.

3.2 AC Operation

An AC adaptor may be used to power the MPM 500e. The AC adaptor disconnects the battery when it is plugged into the DC IN socket.

The DC IN socket is a 2.5mm (positive tip) jack socket, and is protected from reverse polarity. Power requirement is 25mA (nominal), 100mA (max).

FOR SAFETY REASONS we recommend that you unplug the AC adaptor before measuring any surface that is electrically 'live' (e.g. metal mold with faulty heaters). This precaution eliminates a potential hazard that might damage the instrument and AC adaptor.

4 500e OPERATION: DETAILS AND ADVICE

Read this section about the advanced features of the 500e to get the most out of your instrument.

4.1 Two Channel Operation

1) Two channel operation is always between the measurement selected by the rotary selector and temperature.
2) The 500e expects temperature to be measured with a Pt 100 except for the vane probe where the 500e expects a thermocouple as the second channel.
3) When you switch back to the HOLD position, the 500e will revert to displaying the measurement on the rotary selector.

Table 3. Correct probe combinations for two channel measurement.

Pressure	Pressure probe + separate Pt 100
Thermocouple	N/A
Pt 100	N/A
Humidity	Thermohygrometer probe (with built in Pt 100 sensor)
Hot Wire	Hot wire probe + separate Pt 100
Vane	Vane Anemometer probe + Thermocouple probe
RPM	RPM probe + separate Pt 100

4.2 Min/Max

1) Minimum and maximum readings are automatically updated as soon as the instrument is switched ON.
2) The 500e stores the minimum and maximum of four measuremnts: temperature, pressure, humidity and airspeed/RPM.

3) For each measurement, the 500e will store the minimum and maximum readings for the most recent symbol selected. For example, if you are reading temperature in Celsius then select Fahrenheit, the 500e will first clear the Celsius numbers, then start to record minimum and maximum Fahrenheit readings. Also, if you were measuring airspeed and then check RPM, the 500e will clear the airspeed MIN/MAX memories.
4) If you have not made a given measurement, then the 500e will display 'oooo' in that memory.
5) When you press MIN/MAX and HOLD simultaneously all MIN and MAX memories will be cleared, and display will revert to normal mode.
6) The MIN/MAX switch alternates the display between the minimum and maximum readings. You may review readings without having to clear the memory by pressing the SYMBOL switch eight times, scanning all min/max memories, before the 500e returns you to normal mode.
7) When checking the minimum and maximum memories, the 500e will not be measuring and will not update minimum and maximum memories during that time.
8) When checking the MIN and MAX memories, the 'average' function is temporarily suspended but will continue as soon as you press MIN/MAX and HOLD, or scan through all memory locations with the SYMBOL switch.

4.3 Average

1) During averaging the 500e will continue to display the current measurement (NOT the average up to that time).
2) The average is calculated by adding all readings together: When the average button is pressed a second time the microprocessor divides this total by the number of readings.
3) The averaging is suspended if you check minimum and maximum readings. After checking minimum and maximum the averaging will continue.
4) The memory that stores the total of all readings during averaging will eventually 'overflow'. The time for this depends on the number of readings and the size of the reading; for example a temperature measurement at 10.0°C is a much smaller number than airspeed at 5000 ft/min. Such a temperature average would be correct for 50 times longer than an airspeed average.

5) With the 500e in normal reading mode, press the AVG and HOLD buttons simultaneously and the 500e will operate in the 'slow average' mode. This 'slow average' is ideal for long term monitoring (up to several weeks).

6) The length of the average period is selected by you; therefore this feature is a good way to average a measurement over an area. Press the AVG, then scan the area you wish to average by moving the probe about. Press the AVG switch a second time to display the average measurement in that area. So you can use this technique to average a measurement over both space and time.

7) After pressing the AVG button the second time, the calculated average for the measurement selected on the rotary selector is displayed. If you were averaging in the ALTERNATE mode then you can also see the averaged temperature by pressing the SYMBOL switch. Press the SYMBOL switch again and you can recheck the average measurement chosen by the rotary selector.

8) To clear the AVERAGE and return to normal reading mode, press the AVG switch a third time with the HOLD simultaneously.

9) The SYMBOL switch is disabled during averaging to avoid accidental erasure of averaged values.

10) After reading the average, you may continue to average (including the previous averaged readings) by pressing AVG again. The average memory is only cleared by pressing AVG and HOLD simultaneously.

4.4 Symbols

1) The SYMBOL push switch changes the engineering units for a given measurement selected by the rotary selector. For example, temperature can be displayed as either °C or °F; pushing the SYMBOL switch will change from °C to °F. Press the switch again and the display will revert to °C.

2) There is an internally fitted slide switch (accessible by removing the top plates of the MPM 500e). This slide switch selects either Imperial or SI units. In the Imperial mode temperature will first be displayed at Fahrenheit; pushing the SYMBOL switch will change the display to Celsius. In the SI mode tempeature will be first displayed as Celsius; press the SYMBOL switch and the display will change to Fahrenheit. Instruments shipped from the USA have the switch set in the Imperial position, while a 500e shipped from Europe will have the switch set in the SI position.

Table 4. Engineering units available for each type of 500e measurement.

Symbols Switch	Engineering Units							
SI/Metric	Low Pressure	High Pressure	Thermo-couple	Pt 100	%RH	Hot Wire	Vane
Default 1st press 2nd press 3rd press 4th press	Pa PSI in H_2O m/sec† l/min†	bar PSI	°C °F	°C °F	%RH °C* °F*	m/sec l/min Batt. Voltage	m/sec l/min RPM
Imperial							
Default 1st press 2nd press 3rd press 4th press	PSI in H_2O Pa l/min† m/sec†	PSI bar	°F °C	°F °C	%RH °F* °C*	l/min m/sec Batt. Voltage	l/min =m/sec RPM

* Dewpoint temperature.
† Airspeed measured with a pitot tube.

3) Table 4 lists the order that the engineering units appear for each measurement in both Imperial and SI settings.

4) The SYMBOL switch can be used with the MIN/MAX feature to step through the minimum and maximum values for different measurements. When you press the MIN/MAX switch the minimum temperature will be displayed first. Continue to press the SYMBOL switch and the following memories will appear.

	5. Max/Temperature
2. Min/Humidity	6. Max/Humidity
3. Min/Airspeed	7. Max/Airspeed
4. Min/Pressure	8. Max/Pressure

Press the SYMBOL switch one more time and the display will revert to the current reading (normal) mode. By using the SYMBOL switch to step through all the memories then returning to normal display you avoid clearing the minimum and maximum values; if you return to the normal mode by pressing MIN/MAX and HOLD simultaneously, all minimum and maximum values are cleared.

5) As you press the SYMBOL switch to change to different engineering units the 500e will erase the minimum and maximum readings for the previous engineering units. For example, if the minimum temperature reading was 0°C, pressing the SYMBOL switch clears the Celsius minimum and maximum and Fahrenheit minimum and maximum values will now be stored.

6) The SYMBOL switch can be used with the 'average' feature and 'alternate' mode to display both the average measurement and the average temperature. The first average switch closure begins the averaging procedure. The second switch closure displays the average of the measurement selected by the rotary switch. At this time you may press the SYMBOL switch, selecting either the measurement average or the temperature average.

4.5 Hold

The HOLD switch will freeze the display if it is pressed without pressing any of the other special feature switches at the same time. The display will be 'frozen' only as long as this push switch is depressed.

Press the HOLD switch simultaneously with the MIN/MAX, and all minimum and maximum memories will be cleared and the display will return to the normal mode.

3) Press the HOLD and AVERAGE switches simultaneously (on the first average switch closure) and you will be in the 'slow average' mode.

4) Press the HOLD and AVERAGE switches simultaneously (on the third switch closure) and the AVERAGE memories will be cleared, with the 500e returning to normal mode.

5) Press the HOLD switch when selecting pressure and the 500e will be expecting the high pressure probe (512HP) rather than the low pressure (S11LP) probe. Likewise, press the HOLD switch when selecting a new measurement with the rotary switch, and the 500e will be in the 'Secondary Function' mode. See section 10 for details.

4.6 Display

1) The liquid crystal display (LCD) will self-test at turn-on by displaying all the digital segments. To check the correct operation of the various symbols on the display, press SYMBOL when turning the 500e ON and the display will show all of the symbols as well as the digital segments.

2) The low battery indication is the BAT symbol in the top left corner. This symbol appears when the battery voltage is 7.1v (±0.2). You may also check the battery life by selecting BAT on the rotary switch and pressing the SYMBOL switch until the battery voltage appears. NOTE: When checking battery voltage ensure that you do not have a hot wire or optical tachometer connected to the 500e; their high current drain will temporarily reduce the battery voltage leading to incorrect battery life estimates. Refer to Table 2 for estimating remaining battery life from the battery voltage.

3) The display will show 'oooo' when a minimum, maximum or average memory has not been used.

4) When using the rotary selector switch, the 500e will display one reading of 'oooo' before displaying the new measurement.

5) The display is a liquid crystal display. At temperatures below 0°C the response time will be slow and the display may begin to fade. If you are constantly using this instrument at low temperatures then consult Solomat for special low temperature displays.

6) At very high temperatures, i.e. greater than 70°C, the display may temporarily turn black. When the instrument cools down again the display will return to normal. NOTE: The instrument should not be allowed to get to 70°C because of possible damage to the battery.

7) The display is designed for use in ambient and bright sunlight conditions. In dark areas it may be difficult to read the display and we recommend that you use the HOLD button to freeze the display when making a measurement, then move the instrument into good lighting to read the measurement.

8) The processor automatically removes 'leading zeroes', making the instrument easier to read when 4½ digits are not required.

9) The 'serial number' of your 500e microprocessor can be viewed when you turn the instrument ON. This 'serial number' is known as a checksum, and should be quoted to Solomat, should you have any problems with your instrument. To read the checksum: 1) set slide switch to ALTERNATE; 2) Set rotary switch to Thermocouple; 3) Turn the instrument ON, while depressing the HOLD switch; 4) Release the HOLD switch before the decimal points finish cycling. The display will then show the 500e checksum (typical checksum would be 14583).

4.7 500e Casing

1) Since the 500e is precalibrated, there is no need to remove the screws from the back of the case. However, you may wish to remove the front plates (once only) to set up defaulted symbols as either Imperial or SI.

2) The top of the 500e can be wiped clean with a wet cloth; do not clean with acetone or ketones. Do not allow soap and water to get into the electronics; if this does occur then turn the 500e upside down and allow it to dry in a warm dry place at 50°C for 24–48 hours. If this does not remove the residual soap then refer to Point 8 of this section.

Table 5. Spare parts for MPM 500e.

Part Number	Part Description
20001	Battery plate
20002	Rubber foot
20003	Stand
20008	Battery compartment screw
20009	Case screw
20010	'BCD OUT' blanking plate (above DC IN socket)

3) The integral stand can be removed by squeezing the legs, turning upside down, then reinserting into the top stand holes for wall hanging.

4) The stainless steel anti-theft bracket can be used with either the optional anti-theft cable (AT1) or the optional wrist strap (WS1).

5) The MPM 500e case is molded of impact resistant ABS. The unit has undergone drop tests according to IEC Standards and has passed IEC 348:1978.

6) Should you lose any of the small parts of the 500e, then write to Solomat quoting the part number and enclosing a small self-addressed bag and we will mail to you a free replacement. See Table 5 for a list of part numbers.

7) The 500e is not waterproof, and should not be used in very wet areas. The 500e can be used for a short time in the rain but if the display begins to behave erratically then turn the instrument *OFF* and allow it to completely dry in a warm dry place before using again. If the instrument is still not operating correctly refer to point 8 of this section.

8) Should you drop the MPM 500e in the mud then you can try a simple cleaning that may be successful.
   i) Remove the battery.
   ii) Rinse the 500e in clean water until the rinsed water becomes clear.
   iii) Rinse the 500e again in distilled (deionised) water.
   iv) Allow the 500e to dry thoroughly in a warm place at 50°C for 24 to 48 hours.
   v) Replace the battery and switch ON.

   If the 500e still does not work then try again but powering with the AC Adaptor through the DCIN socket. If the instrument now functions correctly then the battery needs replacing. If the instrument still fails to operate refer to the Service Section of this Manual.

9) The LCD window can be cleaned with a soft cloth and warm soapy water but turn the instrument upside down when cleaning and drying to avoid water collecting on the inside of the case.

5 RPM MEASUREMENT

You can measure the RPM of shafts, gears, etc. using one of two probes. The Infra-Red optical tachometer is best for normal use, and the inductive tachometer is best for checking machinery that runs continuously. Please read the section below that pertains to the probe you have. Both

HT5: 0.1 micron PTFE/Glass screw-on filter for best protection (226RH/355RH) and fast response.

HT6: 2 replacement filters (357RH).

HT7: Sintered bronze filter (357RH).

HC1: Humidity Calibration Kit, including calibration jars, salt and 0% RH molecular sieve. Instruction for use are explained in the 'Humidity Calibration' section.

EX5: 1.5 metre (extended) coiled extension cable for all humidity probes.

LB5: Aluminum extension handle for probing the 356RH into grain, etc. Increases reach by 3 feet (approx. 1m). Also for reaching vents, etc. with the 355RH. Two-piece design for easy storage.

ER1: Aluminum jar for measuring water in solids using the ERH principle. With built-in water jacket for constant temperature control. For use with all probes. ERH (Equilibrium Relative Humidity) is becoming the accepted technique for checking water content in solids (grains, paper, tobacco, etc.). Contact Solomat for more information.

8. AIRSPEED MEASUREMENT

The fifth position on the MPM500e function selector is 'Hotwire' for using the 127 MS and 129 MS hot wire anemometers. The sixth function position is 'vane' for using the 228 MS vane anemometer. Plug in your probe, and your anemometer system is functioning. Select either metric (m/sec) or imperial (ft/min) calibration using the SYMBOL switch.

Airspeed is a vital parameter in production areas, environmental studies, heat and ventilation, and refrigeration. Solomat offers two types of anemometers. The 127 MS and 129 MS hot wire anemometers give fast response and can detect very slow drafts. The 228 MS is a vane anemometer for high speed work and improved accuracy. The first two sections detail the handling procedures for the two types of probes. A general section follows on measuring airspeed. Specifications for the three probes are listed in Section 10 of this manual.

8.1 Hot Wire Probes

The 127MS and 129MS use the 'hot wire' or thermal principle to measure windspeed. A small radiator is heated to about 100°C above ambient. The passing air cools the radiator, and the electronics monitor the amount of power required to keep the radiator at a constant temperature. An RTD (resistance temperature detector) corrects for

changes in the ambient temperature. The non-linear signal from the probe is linearized inside the MPM to display airspeed in either ft/min or m/sec.

The hot wire has three distinct advantages over the vane type anemometer; fast response speed, sensitivity down to 0.01 m/sec, and a small diameter sensing head for small pipes.

Warning: The sensor is delicate. DO NOT TOUCH the sensor. Avoid mechanical shock. Carefully store in a safe place. Do not use when the sensing head is wet. If you receive the probe damaged, notify Solomat IMMEDIATELY. Solomat will only be responsible for sensors broken in transit if notified immediately.

Safety Warning: The sensor is heated to 70°C to 100°C above ambient temperature. DO NOT use this probe where it could present a possible safety hazard. It is the user's obligation to assure that equipment meets relevant safety regulations.

The 127MS is designed for easy one-handed measurements to detect drafts, to check fume hoods and to measure air flow in various work places. For measuring airspeed always rotate the sensor until you get the highest reading to ensure that the air flow is in the correct direction for the sensor. The 127MS is calibrated with the white dot pointing towards the air source. Be careful when packing and unpacking the probe. Always protect the sensor with the plastic cap when not in use, since accidental breakage of the sensor is the main cause of failure for hot wire anemometer. *Do not* pinch the rubber cap when removing because you may pinch the sensor if you use too much force.

The 129MS is a new probe from Solomat with an advanced head design. The telesopic handle allows use from short lengths up to 80cm extension with the telescopic handle. The sensor is vertically mounted for 320° measurements. This allows the probe to be used to monitor average airspeed in work places when the air flow frequently changes direction. For measurements in airflows with changing direction, CAREFULLY unscrew the black sensor head. When the sensor head is unscrewed, the 129MS is susceptible to damage, so BE CAREFUL! The calibration may shift by up to 3% of the reading when the sensor head is removed; probes are calibrated with the sensor head.

The 129MS electronics are mounted in the specially designed DIN plug. Do not attempt to recalibrate these adjustments, because the zero and gain adjustments are

interactive. Unless you have access to a wind tunnel of 1% accuracy or better, we recommend that you allow Solomat or a Distributor to make any calibration adjustments.

Both the 127MS and 129MS are calibrated with accurate temperature compensation from 0°C to 50°C. Therefore this is the specification for the Solomat hot wire probes; however you may use these probes beyond this temperature range without damage. If you make measurements outside of the 0–50°C (60°:129MS) temperature range, then take extra care with the probe and consider that the error from temperature compensation will probably be increased.

The 127MS and the 129MS require so much current that the maximum guaranteed airspeed is 15 m/s, and Solomat does not guarantee its accuracy above 15 m/sec. If you request, Solomat can supply from computer files the calibration curves for any airspeed probe.

If you are measuring airspeed in the rain be careful that rain drops do not get near the sensor, because the force of a rain drop in the wind can damage the sensor.

There is no fixed recalibration period, since the measuring environment and amount of usage both affect recalibration. Continuous usage at high windspeed is the quickest way to uncalibrate the probe. Refer to 'Servicing' for returning a probe to check calibration.

8.2 Vane Probe

The 228MS vane anemometer has a propeller which freely spins as air flows past. The speed is electronically sensed and calibrated, then displayed on the 500e. The 228MS is a precision probe that can operate at high windspeeds (up to 60 m/sec with reduced accuracy) but please be careful with the sensing head, and keep dirt away from the bearings. Store the probe carefully. If the probe has been used in the rain, dry before storing.

The specifications allow use from 0°C to 70°C. Any usage out of this range is OUT OF WARRANTY. Sub-zero usage is possible, but Solomat does not warranty performance or accuracy.

The 228MS is sensitive to flow direction. The flow must be in the same direction as the axis of the propeller. You can be within 30° of the true flow angle before noticing any significant error from misalignment. Rotate the probe, watching the display for a stable maximum reading.

The minimum starting speed is about 1.0 m/sec, but any dust or dirt on the bearings will increase this starting speed. Note that dust and dirt affects the starting speed, but has little effect on the high speed calibration. The vane is not an accurate probe below 2.5 m/s.

If the propeller will not spin at low windspeeds, or the display shows the error code:

1) The bearings should not require adjustment, however if you badly shock the sensing head you may need to adjust the two bearings holding the propeller. Using a small screwdriver loosen or tighten the bearing until the propeller just stops being slowed down by the bearing when you blow on it. The ideal amount of slack is 0.001 inches (0.025mm) clearance.

BE CAREFUL! Overtightening can chip the tungsten shaft, shifting calibration.

2) The 228MS is designed to operate over a wide temperature range. However if you find that the probe is sticking when being used at low temperatures or rattling at high temperatures, then you must reset the bearing to compensate for the expansion differences of the metals in the 228MS Vane. When you return to using the probe at more normal temperatures you will have to reset the bearing again. Do not lubricate the bearings because they are designed to run dry.
3) If the vane is running freely but the 500e is still displaying the error code, then there may be a disconnected wire. Check that there are no short/open circuits in the DIN plug. If the wires are sound, then return the probe to Solomat for further inspection.

8.3 Airspeed Measuring Tips

Use the 'AVG' feature of the MPM when calculating volume flow rates. Start the 'AVG' symbol, scan the duct at a slow rate, press the AVG button again when you are done, and the average airspeed is calculated and displayed. The MPM lets you average over any length of time you want. Multiply the duct cross-section by the airspeed to obtain the volume flow rate.

When measuring the average airspeed of a duct with 'dead space', the average can be stopped and restarted when required, to obtain a more realistic average airspeed. Press the AVERAGE switch to temporarily stop averaging, then press again to continue.

Use the 'AVG' feature of the 500e to smooth out short-term variations when measuring airspeed from ducts in complex ventilation systems. A twenty second averaging of the airspeed will be a more repeatable measurement than a quick spot check.

Use the 'AVG' and 'MIN' features of the 500e to determine minimum and average airspeeds around fume hoods, etc. to assure conformity with national safety standards.

Use the 'AVG' facility of the 500e when monitoring local airspeed. Depending on the measured airspeed, you can

Resolution:	0.1°	0.1° (−50/200°C) 0.2% rdg (200°/800°C)

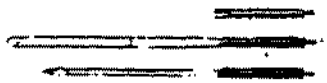
ACCURACY OF MPM 500e

Electronic:	0.07% reading	0.025% reading
Conformity:	0.5°C (−80°/700°C) 1°C (700°/1200°C) 0.5°F (−110°/200°F) 1°F (200°/1500°F) 1.7°F (1500/2300°F)	0.05°C (−50°/600°C) 0.05°F (−95°/400°F) 0.2°F (400°/900°F) 0.2% rdg (600°/800°C, 900°/1300°F)
Cold Junction (25°C):	0.3°C (0.5°F)	N/A
Temperature error:	0.05°/°	0.001% FS/°C

ACCURACY OF SENSOR

Probe Conformity Source	A.N.S.I.		DIN 43760	
			Grade B	**Grade A**
Conformity	**°C**	**°F**	**°C** °F	**°C** °F
20°C/68°F	±2.3	±4.0	0.3 0.5	0.1 0.2
200°C/400°F	±2.3	±4.0	1.3 2.3	0.4 0.7
500°C/930°F	±3.8	±7.0	2.8 5.0	1.0 1.9
1000°C/1800°F	±7.0	±12	N/A N/A	N/A N/A
Long term drift:	Not predictable		<0.05°C/annum	

11.4 % RH



PROBE	**226RH**	**355RH/356RH 357RH**
Sensor:	Thin film capacitor	Thin film capacitor
%RH Range:	0/90	0/98
Dewpoint Range:	−33°/90°C (−27°/195°F)	−33°/90°C (−27°/195°F)
Temperature Range:	0°/70°C (32°/160°F)	−10°/70°C (14°/160°F) (356/357: 100°C for tip only
Resolution:	0.1% RH 0.1°C/F (Dewpoint)	0.1% RH 0.1°C/F (Dewpoint)

ACCURACY OF MPM 500e

Electronic:	0.3% RH	0.3% RH
%RH Conformity:	0%	0%

SENSOR

Linearity and Hysteresis (25°C)	3% RH	2% RH (3% RH >75% RH)
Temperature	+0.24% RH/°C	±0.01% RH/°C
Hysteresis:	2% RH	1% RH
63% Response Time (20°C):	50 sec typical	3 sec typical

DEWPOINT Dewpoint accuracy includes sensor and MPM 500e conformity errors. 1°C (2°F) maximum when measuring conditions are between 5% and 98% RH.

11.5 Hotwire/Vane

PROBE	**127MS**	**129MS**	**228MS**
Sensor:	'Hot wire' thermistor	'Hot wire' thermistor	Rotating vane
Range:	0.01/12 m/s 2/2400 ft/min	0.01/12 m/s 2/2400 ft/min	1/40 m/s 200/8000 ft/min
Temperature Range:	0°/50°C 32°/120°F	−10°/60°C 14°/140°F	0°/70°C 32°/160°F
Dimensions:	8mm dia x 200mm sensor sheath. Attached to 25mm dia handle. 1.5 metre coiled cable.	8mm dia sensor sheath. Telescopic: 260mm collapsed, 850mm extended. 1.5 metre PTFE straight cable.	17mm dia sensor. Telescopic: 280mm collapsed, 880mm extended. 1.5 metre PTFE cable.

ACCURACY OF MPM 500e

Electronic:	0.1% FS	0.1% FS	0.05% FS
Conformity:	0.05 m/s 1 ft/min	0.05 m/s 1 ft/min	N/A

SENSOR

Linearity (20°C):	3% rdg ± 0.1 m/s	3% rdg ± 0.1 m/s	2% rdg ± 0.1 m/s
Temperature Error (0°/50°C):	0.1% rdg/°C	0.1% rgd/°C	N/A

J. R. SIMPLOT COMPANY P.O. BOX 912 POCATELLO, IDAHO 83204
(208) 232-6620 (PLANT) (208) 233-7500 (DIVISION OFFICES)

July 30, 1992

MINERALS & CHEMICAL GROUP

Mr. David J. Pisarski, Manager
Monitoring and Compliance Section
Idaho Air Quality Bureau
Division of Environmental Quality
1410 North Hilton, 3rd Floor
Boise, Idaho 83706

Dear Dave:

The attached material constitutes the results of air permit compliance monitoring during the second quarter of 1992. The second quarter emission reports of 3-hour data for SO_2, NO_x, and ambient air monitoring are included under this cover. All monitors operated continuously during this period, and there were no instances of excess 3-hour average emissions except for those already reported to the Pocatello field office.

For the NO_x report, Table I contains information regarding production and emissions; Table II lists hours of operation and reason for each downtime. The temperature profile on the catalyst was monitored for deterioration during the period.

During this quarter we completed testing on the sources listed below:

1. Nitrogen Solutions - April 24, 1992;
2. Liquid Plant (Nitric Acid Oxidation) - May 4, 1992.

The results of weekly opacity observations during this second quarter are included. There were a few periods of adverse weather in April, May, and June which made reliable readings impossible during observation opportunities and plant operating times. During this period was also our annual plant maintenance turnaround which lasted through the first two weeks of June for the affected facilities.

Please call me if you have questions on the data, results, or tabulation.

Sincerely,

Norman F. Self
Environmental Control Supervisor

Attachments:

cc: Rick Elkins, IAQB Pocatello
(SO_2 only): Mark Masarik, Region 10 USEPA Boise
(w/o attachment): Kenneth Brooks, Administrator DOE

AIR PERMIT COMPLIANCE TEST REPORT

PLANT NAME: J. R. Simplot Company

LOCATION: Pocatello, Idaho, Hwy 30 W, 3 miles North of City

SOURCE SAMPLED: LIQUID PLANT

TESTING COMPANY (if other than plant environmental personnel): _____

CERTIFICATION:

1. Test team leader:

I hereby certify that the test detailed in this report was accomplished in conformance with IDAPA 16.01.1010 (Rules and Regulations for the Control of Air Pollution in Idaho, Sampling and Analytical Procedures) and the Procedures Manual for Air Pollution Control. The results submitted herein are accurate and true to the best of my knowledge.

NAME (print): Dennis C. Bowman

SIGNATURE: Dennis Bowman DATE: 7/27/92

TITLE: Environmental Monitoring Technician

AFFILIATION: Plant Environmental [X] Outside Firm [ ] (see above)

2. Test team report reviewer:

I hereby certify that I have reviewed this report and I find it to be true and accurate, and in conformance with IDAPA 16.01.1010 (Rules and Regulations for the Control of Air Pollution in Idaho, Sampling and Analytical Procedures) and the Procedures Manual for Air Pollution Control, to the best of my knowledge.

NAME (print): Norman F. Self

SIGNATURE: Norman Self DATE: 7/30/92

TITLE: Environmental Control Supervisor

AFFILIATION: Plant Environmental [X] Outside Frim [ ] (see above)

INTRODUCTION

1. If test purpose was for air permit compliance monitoring, indicate [X], and go to the next section; otherwise explain: _____

2. For the source named on the cover page, give test location(s): THE STACK EXIT OF THE OXIDATION UNIT

3. Describe type of process: OXIDATION OF 52% ACID

4. List test date(s): MAY 4, 1992

5. List parameter(s) tested: NOX

6. List CFR 40 Part 60 Appendix A Methods used: 1,2,3,& 7

7. Were there any deviations from the above Methods ? Yes [X] No [ ] If yes, list Appendix number where deviations are explained: 8

8. Was observer(s) present ? Yes [ ] No [X] If yes, give name(s) and affiliation(s): _____

9. Other information or remarks as needed: _____

SUMMARY OF RESULTS

1. List emission results in units of standard for each location specified in INTRODUCTION, Section 1, and for each parameter specified in Section 5.

LOCATION: LIQUID PLANT STACK PARAMETER: NOX
RESULT: Run I .012LB.HR Run II .014LB/HR Run III .014LB/HR,.014LB/
LOCATION: PARAMETER:
RESULT: Run I Run II Run III
LOCATION: PARAMETER:
RESULT: Run I Run II Run III
LOCATION: PARAMETER:
RESULT: Run I Run II Run III
LOCATION: PARAMETER:
RESULT: Run I Run II Run III
LOCATION: PARAMETER:
RESULT: Run I Run II Run III
LOCATION: PARAMETER:
RESULT: Run I Run II Run III
LOCATION: PARAMETER:
RESULT: Run I Run II Run III
LOCATION: PARAMETER:
RESULT: Run I Run II Run III
LOCATION: PARAMETER:
RESULT: Run I Run II Run III

2. Result totals/averages as applicable:
AVERAGE = .013 LB/HR

3. List process data as related to compliance determination: SEE APEND.8
Phosphoric Acid feed rate established at 190 gallons per minute.

4. List permitted emission levels for this source: .1 LB/HR

5. Visible emission summary for each source listed in Section 1 above:
See Appendix #2. Visible emission during time of test = 0 %.

6. Quality assurance procedures are listed in Appendix number: (6)

7. Discussion of errors:

SOURCE OPERATION

1. Description of Process and Control Devices: Operation of process and control devices are as specified in Section 1.1 page 32, of Permit Number 1260-0060 of December 18, 1989: and Section 1.1 and 1.2, of Permit Number 1260-0006 of April 17, 1990.

2. Process and Control Equipment Flow Diagram is in Appendix 8

3. List process and control device operating parameters during test. See Appendix 4.

4. Were these parameters out of the range of normal operating conditions ? Yes [ ] No [X] If yes, explain the difference:

5. Are raw materials and products during testing the same as those during normal operations ? Yes [X] No [ ] If No, explain the differences:

6. Were there process startups, shutdowns or other operational changes during the tests ? Yes [ ] No [X] If yes, explain these changes and times of start and stop:

SAMPLING AND ANALYSIS PROCEDURES

1. Sample ports are located >8 diameters downstream and >2 diameters upstream from the nearest disturbance.
The stack diameter is _____ feet 3 inches.

2. The sampling point description is tabulated in Appendix 8

3. The sampling train is depicted in Appendix 8. Any changes or modifications to the approved description are noted.

4. Analysis procedures are as specified in the July 1, 1989 edition of 40 CFR, Appendix A, Method(s) 7

Are there any deviations from these procedures ? Yes [ ] No [X] If Yes, explain the deviations:

APPENDIX 1

RESULTS AND CALCULATIONS

LIQUID PLANT

Test date - 5/4/92

The stack flow was measured by using a standard Pitot tube and a 0 to 10" oil gage Manometer.
Because of the small diameter of the vent, conventional velocity traverse can not be obtained. So a single point at the center was used.

oil gage manometer reading = .21" H_2O
stack temperature = 86 °F
stack pressure = 25.55 in. Hg
sq. rt. of manometer = .458

Air flow

$$V_s = K_p\, C_p \sqrt{\frac{T_s}{P_s M_s}}\,(\sqrt{\Delta p})$$

K_p = 85.49 ft/sec
C_p = 0.99
T_s = 546 °R
P_s = 25.55 in. Hg
M_s = 28.9 lb/lb mole
ΔP = .21 in. Hg

V_s = 33.3 ft/sec

$$Q_s = (3600\frac{sec}{hr})\, V_s\, A_s (1 - B_{ws})\,(\frac{T_{std}}{P_{std}})\,(\frac{P_s}{T_s})$$

V_s = 33.3 ft/sec
A_s = 0.049 ft^2
B_{ws} = 0.0
T_{std} = 528 °R
P_{std} = 29.92 in. Hg

Q_s = 4.885 dscf/hr

ACFM = 33 x 60 x .049 = 98

Variable values for flask volume and concentration calculations

Measured V_f of flasks from Appendix #6:

Flask #1A	V_f = 1989 mℓ
Flask #6	V_f = 1996 mℓ
Flask #12	V_s = 1976 mℓ
Flaks #13	V_s = 1971 mℓ

V_a in all cases equals 25 mℓ.
P_i (initial pressure) in all cases equals 0.63 in. Hg.
P_f (final pressure) in all cases excluding Flask #13 equals 25.51 in. Hg
P_f for flask #13 equals 25.43 in. Hg.
T_i (initial temperature) in all cases equals 526 °R.
T_f (final temperature) in all cases equals 530 °R.
K_1 = 17.64 °R/in. Hg

µg NO_x from lab results, Appendix #3:

Flask #1A	m = 75.94 µg
Flask #6	m = 74.21 µg
Flask #12	m = 62.66 µg
Flask #13	m = 76.81 µg

K_2 = 6242 (10^{-5}) (lb/scf) / (µg/mℓ)

Flask Volume Calculation (Using Equation 7-2 in 40 CFR Part 60 App. A, Method 7)

$$V_{sc} = K_1 \ (V_f - V_a) \ \left(\frac{P_f}{T_f} - \frac{P_i}{T_i}\right)$$

NOx Concentration calculation (Using Equation 7-4 in 40CFR Part 60 App. A, Method 7)

$$C = K_2 \ \left(\frac{m}{V_{sc}}\right)$$

NOx lb/hr Emission Calculation (Using calculated stack flow of 4855 dscf/hr)

$$E = \left(9188 \frac{dscf}{hour}\right) \ (C)$$

Run #1, Flask #1A:

$$V_{sc} = (17.64 \frac{^\circ R}{inHg})(1989ml - 25ml)(\frac{25.51inHg}{530^\circ R} - \frac{0.63inHg}{526^\circ R}) = 1626ml$$

$$C = [6.242 \; X \; 10^{-5} \; (\frac{lb}{scf}) / (\frac{\mu g}{ml})] \; (\frac{75.94 \mu g}{1626ml}) = 2.91 \; X \; 10^{-6} \frac{lb}{dscf}$$

$$E = (4855 \frac{dscf}{hr}) \; (2.91 \; X \; 10^{-6} \frac{lb}{scf}) = 0.014 \frac{lb}{hr}$$

Run #2, Flask #6:

$$V_{sc} = 1632 \; ml$$

$$C = 2.84 \; X \; 10^{-6} \; \frac{lb}{dscf}$$

$$E = 0.014 \; \frac{lb}{hr}$$

Run #3, Flask #12:

$$V_{sc} = 1615 \; ml$$

$$C = 2.42 \; X \; 10^{-6} \; \frac{lb}{dscf}$$

$$E = 0.012 \; \frac{lb}{hr}$$

Run #4, Flask #13:

$$V_{sc} = 1606 \; ml$$

$$C = 2.98 \; X \; 10^{-6} \; \frac{lb}{dscf}$$

$$E = 0.014 \; \frac{lb}{hr}$$

APPENDIX 2

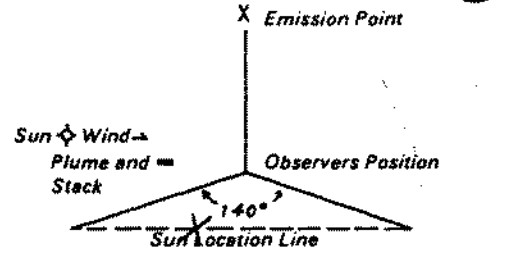
RAW FIELD DATA

IDAHO AIR QUALITY BUREAU
IDHW/DIVISION OF ENVIRONMENT

Visible Emission Observation Form

SOURCE NAME: Superphosphoric Acid Plant	OBSERVATION DATE: 5/4/92
ADDRESS: J.R. SIMPLOT CO. DON PLANT	START TIME: 1120
P.O. BOX 912 (HWY 30 WEST)	STOP TIME: 1130
CITY: Pocatello / STATE: ID / ZIP: 83204	
PHONE: 208-232-6620 / SOURCE ID NUMBER:	
PROCESS EQUIPMENT: Recov LSL Oxidation, NH_3 / OPERATING MODE: Full	
CONTROL EQUIPMENT: final absorber / OPERATING MODE: Full	
DESCRIBE EMISSION POINT: Tailgas Vent	
START / STOP	
HEIGHT ABOVE GROUND LEVEL: START 30 STOP / HEIGHT RELATIVE TO OBSERVER: START 20 STOP	
DISTANCE FROM OBSERVER: START 50 STOP / DIRECTION FROM OBSERVER: START NE STOP	
DESCRIBE EMISSIONS: START / STOP	
EMISSION COLOR: START / STOP / PLUME TYPE CONTINUOUS ☐ FUGITIVE ☐ INTERMITTENT ☐	
WATER DROPLETS PRESENT: NO ☐ YES ☐ / IF WATER DROPLET PLUME: ATTACHED ☐ DETACHED ☐	
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED: START Top of vent STOP	
DESCRIBE BACKGROUND: START Blue Sky STOP	
BACKGROUND COLOR: START / STOP / SKY CONDITIONS: START Clear STOP	
WIND SPEED: START Calm STOP / WIND DIRECTION: START S in STOP	
AMBIENT TEMP: START / STOP / WET BULB TEMP. / RH, percent	

Source Layout Sketch — Draw North Arrow



SEC / MIN	0	15	30	45	SEC / MIN	0	15	30	45
1					31				
2					32				
3					33				
4					34				
5					35				
6					36				
7					37				
8					38				
9					39				
10					40				
11					41				
12					42				
13					43				
14					44				
15					45				
16					46				
17					47				
18					48				
19					49				
20	0	0	0	0	50				
21	0	0	0	0	51				
22	0	0	0	0	52				
23	0	0	0	0	53				
24	0	0	0	0	54				
25	0	0	0	0	55				
26	0	0	0	0	56				
27	0	0	0	0	57				
28	0	0	0	0	58				
29	0	0	0	0	59				
30					60				

NUMBER OF READINGS ABOVE ____ % was	NUMBER OF MINUTES ABOVE ____ % was
AVERAGE OF READINGS ABOVE ____ % was	RANGE OF READINGS ABOVE ____ % was ____ to ____

COMMENTS	OBSERVER'S NAME
	OBSERVER'S SIGNATURE: D Bowman / DATE: 5/4/92
I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS / SIGNATURE	CERTIFIED BY / DATE
TITLE / DATE	VERIFIED BY / DATE

EPA METHOD #7 NO_x SAMPLING

LOCATION: Liquids Plant

DATE: 5/4/92 TIME

TECHS: DB RS

TEST:

OBSERVER:

BAROMETRIC PRESS: Initial 29.55 Final

AMBIENT TEMP:

SAMPLE NO.	FLASH NO.	FLASH VOL (ML)	ABS SOLN VOL (ML)	TIME	LOSS OF VAC OVER ONE MINUTE	INITIAL COND FLASH				FINAL COND FLASH				ΔP OF CENTER POINT
						cm Hg	IN Hg	°F.	°R	cm Hg	IN Hg	°F.	°R	
1	1A	1989	25		0	1.6	.63	66	526	64.8	25.51	70	530	
2	6	1996	25		0	1.6	.63	66	526	64.8	25.51	70	530	
3	12	1976	25		0	1.6	.63	66	526	64.8	25.51	70	530	
4	13	1971	25		0	1.6	.63	66	526	64.6	25.43	70	630	

1A 44.9 − 43.3 = 1.6

6 44.9 − 43.3 = 1.6

12 44.9 − 43.3 = 1.6

13 44.9 − 43.3 = 1.6

1A	6	12	13
76.4	76.4	76.4	76.3
11.6	11.6	11.6	11.7
64.8	64.8	64.8	64.6

LOCATION: Liquid Plant

TEST: METHOD 3 INTIGRATED SAMPLE

DATE: 5/4/92

TECH: Bowman / Satterfield

BAROMETRIC PRESS: 25.55

SAMPLE LOCATION IN STACK PITOT TUBE

Leak Check of equipment OK

TIME	INDICATED FLOW RATE	TEMP °F. STACK	ΔP PITOT TUBE
1000	2.0	86	.21

ORSAT ANALYSIS	RUN I	RUN II	RUN III	RUN IV	RUN V
% CO_2					
% O_2					
% CO					

% N by difference

Md (dry molecular weight) lb/lb mole = 0.44 (% CO_2) + 0.32 (% O_2) + 0.23 (% N + % CO)

Md =

Md =

Md =

APPENDIX 3

LABORATORY REPORT

Is Chain of Custody applicable ? Yes [ ] No [X] If Yes, chain of custody is attached. If No, explain: **All samples are handled, prepared and analyzed only by members of the test team. No transfer is involved.**

INSTRUCTIONS FOR USE OF ENVIRONMENTAL PROTECTION AGENCY
COMPLIANCE NO_x SAMPLES

Note: All Method 7 procedures referred to are from the amended method published in the Federal Register, Vol. 42, No. 160, Part II, Thursday, August 18, 1977, pp. 41784-41786. This amended method should be adhered to in all details in the analysis of these reference standards.

1. Prepare absorbing solution according to Section 3.1 of the method.

2. Prepare each reference sample for analysis as follows: Wrap a paper towel around the ampoule and with the ampoule in an upright position break off the top at the prescored mark by exerting pressure sideways. From the ampoule pipette exactly 5 ml of the reference sample into a 100-ml beaker. Add 25 ml absorbing solution to the beaker; adjust the pH to 9-12 (using pH paper as indicated in Section 4.2 of the method) by dropwise addition of sodium hydroxide (1N). Quantitatively transfer the contents of the beaker to a ~~50-ml~~ 100 volumetric flask and dilute exactly to the mark with deionized, distilled water. Mix thoroughly and pipette a 25-ml aliquot of the diluted sample into a porcelain evaporating dish. Beginning with the evaporation step in Section 4.3, complete the sample analysis.

3. Calculate total µg NO_2 per sample using Equation 7-3. Calculate the sample concentration, C (concentration of NO_x as NO_2, dry basis, corrected to standard conditions, mg/DSCM), using Equation 7-4. A value of 2000 ml should be used for V_{sc} in Equation 7-4.

4. Audit results in mg/DSCM and compliance test results in total µg of NO_2 are to be transmitted by phone and/or writing to the agency requiring the test.

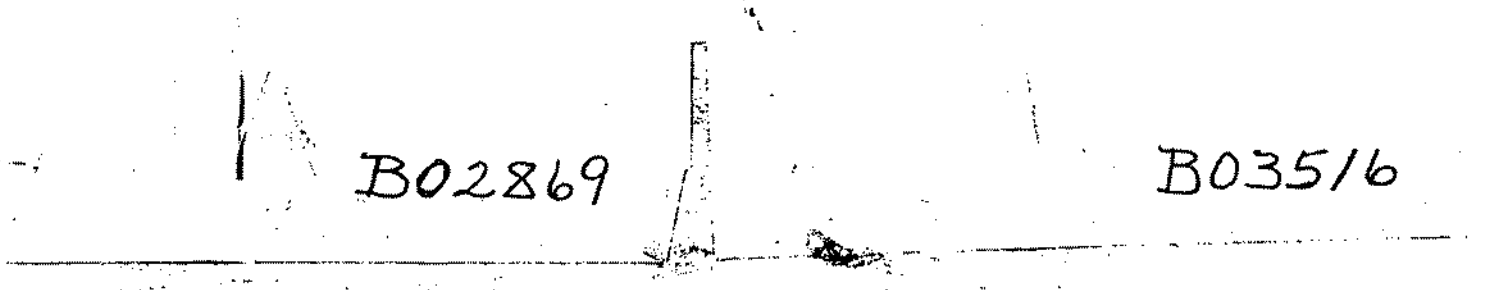
Change in Procedure:

Transfer Beaker Contents into a 100ml vol. flask (Dilution 2). Pipetted 20 mls of this preparation into 100 ml vol. Flask, (Dilution 5)

Factor F = (2)(5) = 10

Analyze via Method 7A for Audit #5
B02869, and B03516

Analysis via Method 7A & 7B for Audit #5
B01178, and B03533


B02869
B03516

NO_x Audit Samples for 1992 Liquid Plant and Nitrogen Solutions Audit and Compliance Test

U.S. ENVIRONMENTAL PROTECTION AGENCY
RESEARCH TRIANGLE PARK, N.C. 27711

COMPLIANCE TESTING

NO_x Samples

EPA

B01178

U.S. ENVIRONMENTAL PROTECTION AGENCY
RESEARCH TRIANGLE PARK, N.C. 27711

COMPLIANCE TESTING

NO_x Samples

EPA

B00533

5/27/92 | METHOD 7A

NO_x AUDIT SAMPLES FOR 1992 Liquid Plant and Nitrogen Solutions.

AUDIT # B02869

AUDIT # B03516

METHOD 7A Ion Chromatagraphic

$$C = K_2 m / V_{sc} \; ; \; K_2 = 10^3 \text{ mg/scm}$$

$$V_{sc} = 2000 \text{ ml}$$

Control 200 ug → $(1.974 \text{ ppm} + 1.978_{pp})/2 = 1.976 \text{ ppm}$

B02869	READING #1	READING #2	Average
F=4	1.989_{ppm}	1.987_{ppm}	$1.988_{ppm} = 198.8$ ug

$$C_{B02869} = \frac{(4)(198.8 \text{ ug})(10^3 \text{ mg/scm})/\text{ug/ml}}{2000 \text{ ml}} = 397.6 \frac{\text{mg N}}{\text{DSCM}}$$

B03516	READING #1	READING #2	Average
F=4	4.440_{ppm}	4.442_{ppm}	$4.441 \text{ ppm} = 444.1$ ug

$$C_{B03516} = \frac{(4)(444.1)(\text{ug } NO_2)(10^3 \text{ mg/scm})/\text{ug/ml}}{2000 \text{ ml}} = 888.2 \frac{\text{mg } NO_2}{\text{DSCM}}$$

6/18/92 | METHOD 7A |

NO_x Audit Samples For 1992 Liquid Plant and Nitrogen Solutions Audit # B01178, Audit # B00533

		Reading #1	Reading #2	Average	
B01178 #1	F=10	2.012 ppm	2.051 ppm	2.0315	2.019 ppm
B01178 #2	F=10	2.022 ppm	1.991 ppm	2.0065	201.9 ug
B00533 #1	F=10	3.736 ppm	3.805 ppm	3.7705 ppm	3,780 75 p
B00533 #2	F=10	3.759 ppm	3.823 ppm	3.791 ppm	378.1 ug

$C = K_2 M / V_{sc}$; $K_2 = 10^3$ mg/scm ; $V_{sc} = 2000$ ml

$$C_{B01178} = \frac{(10)(201.9\ ug)(10^3\ mg/scm)(ug/ml)}{2000\ ml} = 1009.5\ mg/DSCM$$

$$C_{B00533} = \frac{(10)(378.1)(ug\ NO_2)(10^3\ mg/scm)(ug/ml)}{2000\ ml} = 1890\ mg/DSCM$$

2.5 ppm NO_2 Control = (2.495 ppm + 2.499 ppm)/2 = 2.497 ppm

6/18/92 | METHOD 7B | Dewayne

NO_x Audit Samples Run #1 Audit # B01178
Audit # B00533
λ 210 nm

	Reading #1	Reading #2	Average	
Blank	0.000	0.000	0.000	
50 ug	0.089	0.091	0.090	$= A_1$
100 ug	0.169	0.172	0.1705	$= A_2$
150 ug	0.268	0.271	0.2695	$= A_3$
200 ug	0.337	0.341	0.339	$= A_4$

$$K_c = \frac{50\ A_1 + 2A_2 + 3A_3 + 4A_4}{A_1^2 + A_2^2 + A_3^2 + A_4^2} = 577.492585$$

$$K_c = \frac{50\ (0.090 + 2(0.1705) + 3(0.2695) + 4(0.339))}{(0.090)^2 + (0.1705)^2 + (0.2695)^2 + (0.339)^2}$$

	Reading #1	Reading #2	Average	
B01178 #1	0.351	0.348	0.3495	0.340
B01178 #2	0.330	0.331	0.3305	
B00533 #1	0.596	0.587	0.5915	0.59025
B00533 #2	0.587	0.591	0.589	

B01178 ⇒ (577.492585)(0.340)(5)(2) = 1963.47479

B00533 ⇒ (577.492585)(0.59025)(5)(2) = 3408.64998

$C = K_2\, m / V_{sc}$, $K_2 = 10^3$, $V_{sc} = 2000$ ml

B01178 = (1963.47479)(10³)/2000 = 981.737 ug/DSCM

B00533 = (3408.64998)(10³)/2000 = 1704.325 ug/DSCM

200 ug Control = [(0.340 + 0.342)/2] 577.49 = 196.9 ug

6/18/92 — Dewayne King

NO_2 Determination for J.R.S. Dan Plant Liquid Plant

@ 210 nm 100 ml original volume

	Reading 1	Reading 2	Average	
Blank	0.000	0.000	0.000	
50 ug	0.089	0.091	0.090	$= A_1$
100 ug	0.169	0.172	0.1705	$= A_2$
150 ug	0.268	0.271	0.2695	$= A_3$
200 ug	0.337	0.341	0.339	$= A_4$

$$K_c = 50\,\frac{A_1 + 2A_2 + 3A_3 + 4A_4}{A_1^2 + A_2^2 + A_3^2 + A_4^2}$$

$$K_c = \frac{50\,(0.090 + 2(0.1705) + 3(0.2695) + 4(0.339)}{(0.090)^2 + (0.1705)^2 + (0.2695)^2 + (0.339)^2} =$$

$$K_c = \frac{50\ (2.5955)}{0.22472} = 577.4926$$

	Reading 1	Reading 2	Average
#1A	0.133	0.130	0.1315
#12	0.111	0.106	0.1085
#13	0.126	0.140	0.133
#6	0.128	0.129	0.1285

#1A = (577.4926)(0.1315)(1) = 75.94 ug NO_2

#12 = (577.4926)(0.1085)(1) = 62.66 ug NO_2

#13 = (577.4926)(0.133)(1) = 76.81 ug NO_2

#6 = (577.4926)(0.1285)(1) = 74.21 ug NO_2

AVE 72.405 ug NO_2

6/18/92 | METHOD 7B | Dewayne

NO_x AUDIT SAMPLES RUN # 2 AUDIT # B00533
AUDIT # B01178

@ 210 nm

	READING #1	READING #2	Average
Blank	0.000	0.000	0.000
50 ug	0.089	0.092	0.0905 = A_1
100 ug	0.173	0.173	0.173 = A_2
150 ug	0.283	0.284	0.2835 = A_3
200 ug	0.351	0.352	0.3515 = A_4

$$K_c = \frac{50\,(A_1 + 2A_2 + 3A_3 + 4A_4)}{A_1^2 + A_2^2 + A_3^2 + A_4^2}$$

$$K_c = \frac{50(0.0905 + 2(0.173) + 3(0.2835) + 4(0.3515)}{(0.905)^2 + (0.173)^2 + (0.2835)^2 + (0.3515)^2} = 556.304$$

AUDIT RESULTS

	READING #1	READING #2	Average	
B01178 (#1) F=10	0.310	0.306	0.308	0.30775
B01178 (#2) F=10	0.308	0.307	0.3075	
B00533 (#1) F=20	0.277	0.280	0.2785	0.27675
B00533 (#2) F=20	0.276	0.274	0.275	

$C = K_c\, AF\, K_2 / V_{sc}$; $K_c = 556.304$, $K_2 = 10^3$ $V_{sc} = 2000$ ml

$C_{B01178} = (556.304)(0.30775)(10)(10^3)/2000 = 856.01$ ug/DSCM

$C_{B00533} = (556.304)(0.27675)(20)(10^3)/2000 = 1539.57$ ug/DSCM

200 ug Control [(0.356 + 0.358)/2] 556.304 = 198.6 ug

6/18/92 | METHOD 7B |

DON PLANT LIQUID PLANT from 100 ml
RUN #2

	READING #1	READING #2	Average
FLASK #1A	0.134	0.137	0.1355
FLASK #12	0.085	0.086	0.0855
FLASK #13	0.147	0.148	0.1475
FLASK #6	0.146	0.147	0.1465

$C = K_c F A$; $K_c = 556.304$, $F = 1$

C #1A = (556.304)(0.1355)(1) = 75.38 ug NO_2
C #12 = (556.304)(0.0855)(1) = 47.56 ug NO_2
C #13 = (556.304)(0.1475)(1) = 82.05 ug NO_2
C #6 = (556.304)(0.1465)(1) = 81.50 ug NO_2

AVE = 71.51 ug NO_2

200 ug NO_2 Control = 198.6 ug NO_2

GAS ANALYSIS DATA FORM

PLANT Tugwell Plant
DATE 5/14/92 TEST NO.
SAMPLING TIME (24-hr CLOCK) 1000
SAMPLING LOCATION Stack
SAMPLE TYPE (BAG, INTEGRATED, CONTINUOUS) integrated
ANALYTICAL METHOD Orsat
AMBIENT TEMPERATURE
OPERATOR Bowman

COMMENTS:

RUN / GAS	1		2		3		AVERAGE NET VOLUME	MULTIPLIER	MOLECULAR WEIGHT OF STACK GAS (DRY BASIS) M_d
	ACTUAL READING	NET	ACTUAL READING	NET	ACTUAL READING	NET			
CO_2	.6	.6	.6	.6	.6	.6		44/100	.264
O_2 (NET IS ACTUAL O_2 READING MINUS ACTUAL CO_2 READING)	20.6	20	20.6	20	20.6	20		32/100	6.4
CO (NET IS ACTUAL CO READING MINUS ACTUAL O_2 READING)								28/100	
N_2 (NET IS 100 MINUS ACTUAL CO READING)		79.4		79.4		79.4		28/100	22.232
								TOTAL	28.90

APPENDIX 4

RAW PRODUCTION DATA

I have reviewed the attached log sheets, and I verify that these are the plant operating data, as entered by the operator, during the time of the test.

Name (print): Delbert L Butler

Signature: Delbert L Butler Date: 7-30-92

Title: Amoco Plant Area Manager

S P A OXIDATION

DATE: 5-4-92

TIME	FLOWS: FEED ACID	NITRIC	WATER TO COMPRESSOR	WATER TO ABSORBERS	SCRUBBER UPPER —	SCRUBBER LOWER —	TEMPERATURES: SCRUBBER -OUT COOLED LIQUOR	SPRAGER	SCRUBBER-OUT	COMP. VAPOR IN—	COMP. VAPOR OUT—	COMP. COOLER C.W. — OUT	COMP. — IN COOLED LIQUOR	LEVELS: HNO3 FEED TANK	SCRUBBER	COMPRESSOR SEPARATOR	ABSORBER	PRESS: ABSORBER PRESSURE	SP. GRAVITY: NHO3 ACID FEED TANK	SCRUBBER	COMPRESSOR	ABSORBERS	EMF: REACTOR EMF	MISCELLANEOUS
2400	170	62	60	.25		1.4	74	72	71	92		79	87	72	40	62	40	70	1332	1000	1000	1000	946	
0200	170	61	60	.25		1.4	69	68	67	85		69	78	78	40	62	40	70	1332	1000	1000	1000	910	
0400	165	62	60	.25		1.5	68	67	66	85		78	82	80	40	"	40	70	1332	1000	1000	1000	918	
0600	165	60	60	.25		1.5	70	69	68	88		66	79	69	40	62	40	70						
0800	165	5.4	.6	.25		1.5	71	73	72	90		74	84	55	40	65	40	70	1332	1000	1000	1000	947	
1000	160	5.4	.6	.25		1.5	72	74	73	89		69	81	48	40	65	40	70	1332	1000	1000	1000	929	
1200	168	5.4	.6	.25		1.5	74	76	75	92		78	85	44	40	65	40	70	1332	1000	1000	1000		
1400	170	1.4	.6	.25		1.5	78	78	79	97			91	77	40	125	40	70	1332	1000	1000	1000	981	
1600	160	.6	.6	.25		1.4	78	79	79	94		73	85	73	40	124	40	70	1332	1000	1000	1000	921	
1800	160	.6	.6	.25		1.4	76	78	76	93		75	86	68	40	125	40	70	1332	1002	1000	1000	922	
2000	160	1.54	.6	.25		1.4	76	78	77	94		77	87	63	40	125	40	70	1332	1002	1000	1000	937	
2200	160	1.54	.6	.25		1.4	75	77	76	94		78	88	59	40	127	40	70	1330	1002	1000	1000	919	

HNO3 Integrator Start — 303740

HNO3 Integrator End — 304237

OPERATOR: KALEB- Shift I	OPERATOR: TATE Shift II	OPERATOR: KW Shift III
68.0 39.1	68.6 32.1	68.5 39.5

336-6104

J. R. SIMPLOT CO. ---- LIQUID PLANT

EVAPORATOR ONE

PRESSURE

VACUUM	RECYCLE PUMP OUTLET	STEAM CHEST	STEAM VALVE POSITION
30		390	7/8
30		400	7/10
30		390	7/10
30		395	7/10
30		390	7/11
30		390	7/8
30		400	7/8
30	23	350	7/6
30	21.6	370	8/10
30	21.2	370	8/10
30	21.6	370	8/10
30	21.5	370	8/10

FLOW

EVAPORATOR FEED	SURFACE CONDENSER	FLUORINE SCRUBBER	DESUPER HEATER
75	F	6.2	30
85		5	25
85		5	28
80		6	31
85		7.0	31.2
85		7.4	31.7
85		7.8	31.2
85		6.2	31.2

TEMPERATURE

ABOVE HEATER	BELOW HEATER	STEAM CHEST	SURFACE COND. IN	SURFACE COND. OUT
395	390	406	127	122
405	401	414	126	119
401	401	411	126	119
403	398	409	118	107
401	396	457	132	118
402	395	457	135	121
400	394	457	134	119
399	392	456	134	119

AMPERE

RECYCLE PUMP	VACUUM PUMP	PRODUCT PUMP	FEED ACID PUMP
185	32	6	7
185	32	6	7
185	32	6	7
200	32	5.5	7.5
200	32	5.0	7.5
200	32	6.0	7.5
200	32	6.0	7.5

EVAPORATOR TWO

MISC.

VACUUM	EVAPORATOR FEED	SURFACE CONDENSER	DESUPER HEATER	RECYCLE PUMP	PRODUCT PUMP
24	15			44	6
21	15			44	6

TEMP

ABOVE HEATER	BELOW HEATER	STEAM CHEST	SURFACE CONDENSER
361	353	447	95
361	352	447	96
359	350	446	98

EVAPORATOR THREE

PRESSURE

VACUUM	RECYCLE PUMP OUTLET	STEAM CHEST	STEAM VALVE POSITION
23.1		7	98
22.5		7.2	110
22.5		7.2	110
22.5		7.2	110
22.5		7.2	110

FLOW

EVAPORATOR FEED	SURFACE CONDENSER	FLUORINE SCRUBBER	DESUPER HEATER
70	2300	5	11
70	2300	4	10
70	2500	4	10
60	1500	4	10
75	2500	5	11
75	2500	6	11.5
75	2500	5	11
75	1500	5	11

TEMPERATURE

ABOVE HEATER	BELOW HEATER	STEAM CHEST	SURFACE COND. IN	SURFACE COND. OUT
395	392	408	166	160
396	393	408	168	163
396	393	409	169	164
392	389	405	170	165
392	388	409	169	163
391	388	408	169	163

AMPERE

RECYCLE PUMP	VACUUM PUMP	PRODUCT PUMP	FEED ACID PUMP
195	32	6	7
195	32	6	7
195	32	6	7
195	32	6	7.5
195	32	6	7.5
195	32	6	7.5
195	32	6	7.5

EAST TOWER

AMPERE

EAST PUMP	WEST PUMP	TOWER FAN
150	150	70
150	150	70
150	150	70
150	150	70
150	150	70

MISC.

CHLORINE FEED	TOWER PH	TEMPERATURE OUT	BLOWDOWN GPM
30	7.2	74	
30	7.2	75	
30	7.4	75	
30	7.4	74	
30	7.4	74	

NORTH PUMP
32
32
32
32
32
32
32
32
32
32
32

ANALYSIS	TOTAL	POLY
SHIFT 1	60.4	46.5
SHIFT 2	62.7	45.0
SHIFT 3	68.9	49.7

EVAP #1

110500

ANALYSIS	TOTAL	POLY
SHIFT 1	68.5	49.6
SHIFT 2	18C	42.4
SHIFT 3		

EVAP #2

15358

ANALYSIS	TOTAL	POLY
SHIFT 1	60.4	49.4
SHIFT 2	59.1	44.5
SHIFT 3	69.3	46.7

EVAP #3

104072

INVENTORY	ANALYSIS	
TANK		
TANK	154/154	
TANK		
TANK		
TANK	90/161	
10-34		
10-34		

	CALC HARD	ALK	COND	ZINC
	500/800	50/200	1800/2500	.5/1.0
SHIFT 1				
SHIFT 2				
SHIFT 3				

SHIFT	1	2
SODA ASH		

STEAM | 138397

OPERATOR: [illegible] SHIFT 1

OPERATOR: Tate SHIFT 2

2 chem 1:45, Cal rate 1:30 high Filter Temps

OPERATOR: TW # 2.

J. R. SIMPLOT CO. — LIQUID PLANT FILTER

DATE: M

#1 FILTER						#2 FILTER						#3 FILTER						#4 FILTER					
TIME START	CLEAR / CLOUDY	CYCLE TIME	SERVICE PRESSURE	CAKE THICKNESS	CYCLE GALLONS	TIME START	CLEAR / CLOUDY	CYCLE TIME	SERVICE PRESSURE	CAKE THICKNESS	CYCLE GALLONS	TIME START	CLEAR / CLOUDY	CYCLE TIME	SERVICE PRESSURE	CAKE THICKNESS	CYCLE GALLONS	TIME START	CLEAR / CLOUDY	CYCLE TIME	SERVICE PRESSURE	CAKE THICKNESS	CYCLE GALLONS
1100	51	60	60	1¼	2682	1140	52	60	60	1¼	2315	1150	52	60	60	1¼	2005						
1140	50	60	60	1¼	2666	1240	50	60	60	1½	2885	1240	52	60	60	1½	2899	1235	50	60	60	1½	3975
210	50	60	60	1½	2794	220	51	60	60	1½	2985	235	52	60	60	1½	2995						
312	54	60	60	1½	3501	320	50	60	60	1½		337	53	60	60	1½	3019						
420	50	60	60	1½	2917	440	50	60	60	1½	10856	452	50	60	60	1½	2191						
550		60	60	1½	2367	548		60	60	1½	2042	609		60	60	1½	2347						
7:15	51	60	59	1¼	2802	8:47	52	60	64	1¼	?	7:32	52	60	62	1½	2647	11:48	54	60	62	1½	2589
8:35	52	60	59	1½	2016	9:38	53	60	54	1½	1468	8:49	53	60	62	1½	2020	1:23	53	60	62		
9:58	52	60	59	1¼	1923	10:55	52	60	54	1½	?	10:19	52	60	62	1½	1850						
11:18	53	60	59	1½	2215	12:52	52	60	54	1½	1474	11:32	53	60	62	1½	2000						
12:45	53	60	59	1"	1689	1:51		60	54			1:01	54	60	62	1"	1676						
1:44		60	59									1:57	53	60	62								
1905	54	60	64	1½	2082	1520	53	60	55	1¼	1320	1510	53	60	64	1½	1804	1455	54	60	64	1½	1976
1615	55	60	64	1½	2063	1615	55	60	55	1¼	1385	1615	54	60	64	1½	1903	1905	59	60	64	1½	1960
1735	54	60	64	1½	2124	1735	55	60	55	1¼	1507	1735	54	60	64	1½	1958	1905	54	60	64	1½	2053
1855	55	60	64	1½	2074	1850	56	60	55	1¼	1510	1845	53	60	64	1½	1913	2100		60	64		
2015	54	60	64	1½	2004	2025	54	60	53	NR	1471	2015	53	60	64	1½	1958						
2130	53	60	64			2140	54	60	55			2150	52	60	64								

TIME	AMPERES 1C 1E: FILTER FEED RECYCLE	1A RECYCLE	REPULP RECYCLE	EAST FILTER FEED	WEST FILTER FEED	NORTH FILTER FEED	W. AGING TANK MIXER (↔)	REPULP MIXER	E. AGING TANK MIXER	FILTER FEED TK. MIXER	2C W. AGING COOLER PUMP	EMF	3C	4C	TEMPS. (3) FILTER FEED TANK	WEST AGING TANK	(2) EAST AGING TANK	(1)	S
2400	39	K	20	16	16	M		23			49		18	19	196		296	350	18
0100	39		20	15	16	17		23			49		18	19	197		294	349	
0200	39	18	20	15	16	17		23			49		18	19	196		292	348	
0300	39	1	20	15	16	17		23			49		14	19	197				
0400	39		20	15	16	17		23			49		18	19	195		293	350	
0500	39		20	15	15	17		23			49		14	19	198		297	350	
0600	39	—	32	19	17	17	(↔)	23			49		17	18	200		297	350	
0700	39	—	32	19	17	17		23			49		17	18	204		298	350	17
0800	39	—	32	19	—	17		23			49		17	18	201		278	351	
0900	39	—	32	19	17	17		23			49		17	18	201		58	351	
1000	39	—	32	19	17	17		23			49		17	18	191		276	350	18
1100	39	—	32	19	17	17		23			49		17	18	196		27	349	
1200	39	18	32	19	17	17		23			49		17	18	195		29	349	
1300	39	18	32	19	17	17		23			49		17	18	195		285	350	17
1400	39	18	32	19	17	17		23			49		17	18	200		290	351	
1500	39	18	32	19	17	17		23			49		17	18	203		295	350	
1600	40	—	33	—	17	17	—	23	—	—	50	—	17	20	202		292	349	18
1700	40	18	33	18	17	17	—	23	—	—	50	—	17	20	203		290	348	
1800	40	—	33	19	17	17	—	23	—	—	50	—	17	20	202		285	350	
1900	40	18	33	19	—	—	—	23	—	—	50	—	17	20	209		285	349	
2000	40	18	33	—	17	17	—	23	—	—	50	—	17	20	202		282	345	
2100	40	—	33	19	17	17	—	23	—	—	50	—	17	20	199		280	349	
2200	40	—	33	19	17	17	—	23	—	—	50	—	17	20	198		275	349	
2300																			

(22)

OPERATOR

SHIFT 1 OPERATOR L. Lorenz

SHIFT 2 OPERATOR Allen

LEVELS

AGE TK.		REPULP DAY TK.	
. AGE TK.		REPULP STG. TK.	

COMMENTS:

LEVELS

E. AGE TK.		REPULP DAY TK.	
W. AGE TK.		REPULP STG. TK.	

COMMENTS: #3 Filter, extracting ram broke via 105 204

LEVELS

E. AGE TK.		REPULP DAY	
W. AGE TK.		REPULP STG.	

COMMENTS:

APPENDIX 5

TEST LOG

There will be no entries in this section

APPENDIX 6

CALIBRATION AND QUALITY ASSURANCE PROCEDURES/RESULTS

Calibration of the Method 7 Collection for VOC

Flasks 1/14/91

the Flasks used are #1, #6, #12, and #13.

the Flask was filled with DI water and filled all the way to the top of the stopcock. then the total Volume of water is measured using Grad Cylinder

the Results are as follows.

Flask	Volume	
#1	~~2014 ml~~ 1996 ml	
#6	1976 ml	
#12	1971 ml	
#13	1989 ml	this Flask 5/14/93
#1A		

Denver

Calibration of the Lab Barometer.

5/4/92

the Barometer is Calibrated by Calling the USWS located 1 mile west of the Lab.

the elevation of Both Lab & USWS. is 4,454 ft above Sea Level.

Results.

USWS	Lab.
25.553	25.55

Dennis.

APPENDIX 7

PROJECT PARTICIPANTS

1. Dennis C. Bowman, Environmental Monitoring Technician
2. Ron Satterfield, Environmental Monitoring Technician
3. Norman F. Self, Environmental Control Supervisor
4. E. Dewayne King, Assistant Environmental Analyst_____

APPENDIX 8

ADDITIONAL INFORMATION

1. Process flow Diagram
2. Method 7 Sample Train
3. Sample Point Description
4.
5.

IL GAS ATMOS.
02

9.73
2.00
0.67
0.09

12.51
75
79
100
12.5
30.7

FORM DWG. #: DON\8800\8800A100.DWG (BLOCK=SYM250)

PROJ. NO.: 913-0909-3956	W. O. NO.: F3956	C.I.P. NO.: 5-S-88069

Simplot

MINERALS & CHEMICAL DIVISION POCATELLO, IDAHO

SUPERPHOSPHORIC ACID
LSL OXIDATION SYSTEM
NITRIC ACID RECOVERY
FLOW SHEET 1333 TPD LSL

1	2/20/90	
		CAD DWG. #: J019002C
NNER	2/22/90	130-7260-102 H

SCALE: NON

REVISION D

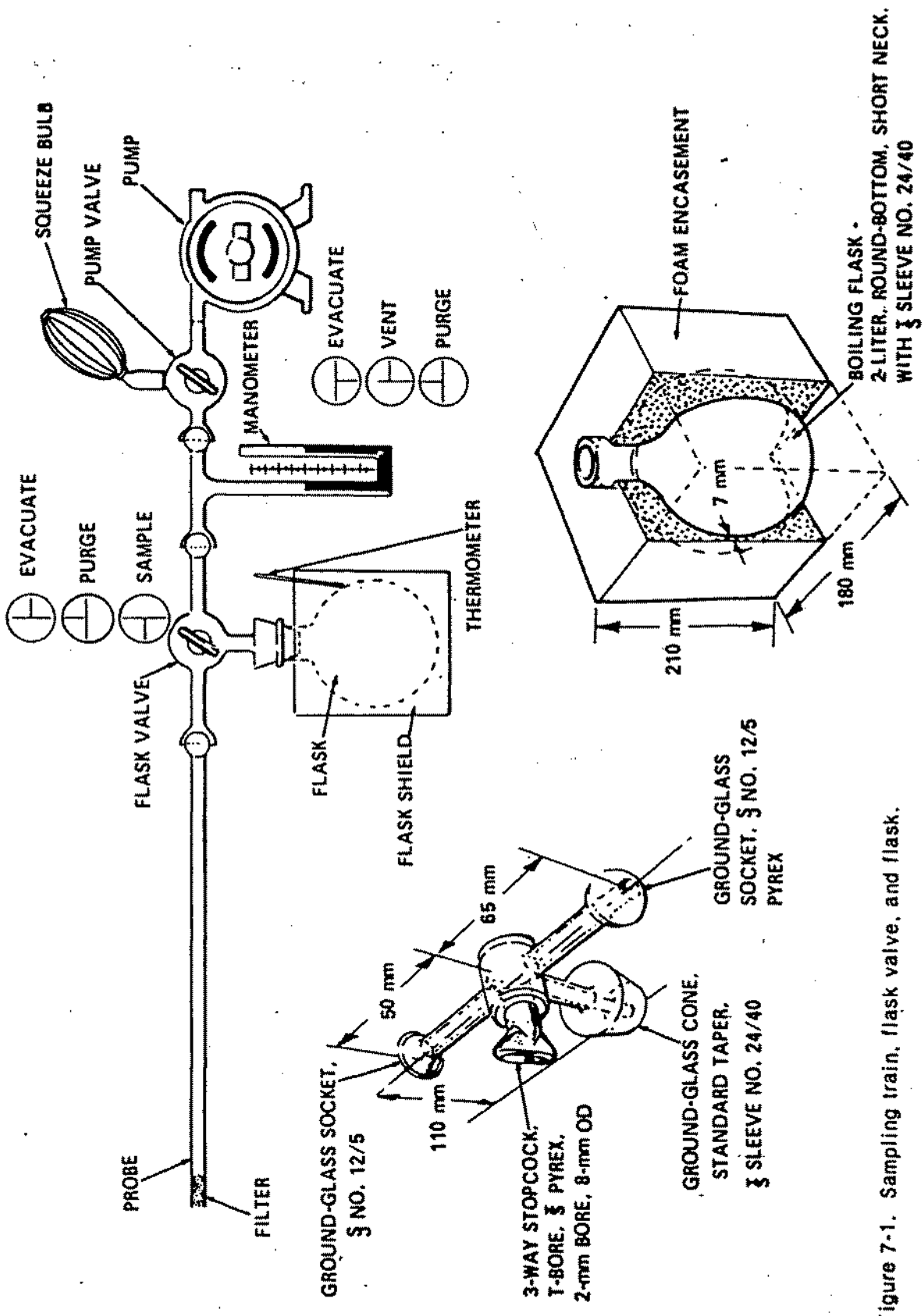
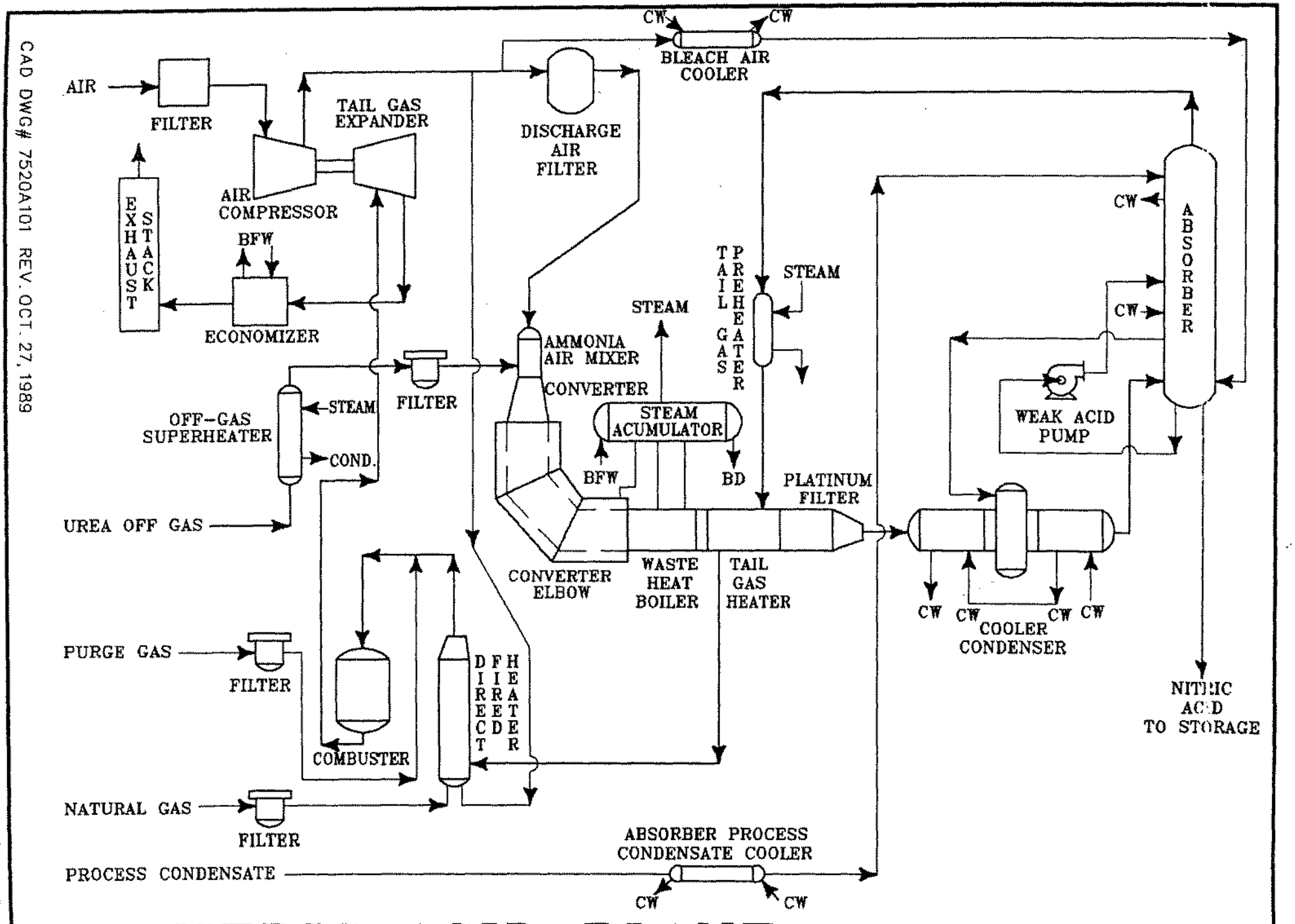


Figure 7-1. Sampling train, flask valve, and flask.

DESCRIPTION OF SAMPLING POINT

Stack inner diameter:	3 inches
Number of traverse points:	Not Applicable for Method #7
Sample ports:	1 inch diameter to admit glass sample probe


CAD DWG# 7520A101 REV. OCT. 27, 1989
CW
CW
BLEACH AIR COOLER
AIR
FILTER
TAIL GAS EXPANDER
DISCHARGE AIR FILTER
EXHAUST STACK
AIR COMPRESSOR
BFW
ECONOMIZER
TAIL GAS PREHEATER
STEAM
STEAM
ABSORBER
CW
CW
AMMONIA AIR MIXER
CONVERTER
FILTER
STEAM ACUMULATOR
WEAK ACID PUMP
OFF-GAS SUPERHEATER
STEAM
COND.
BFW
BD
PLATINUM FILTER
UREA OFF GAS
CONVERTER ELBOW
WASTE HEAT BOILER
TAIL GAS HEATER
CW
CW
CW
CW
COOLER CONDENSER
PURGE GAS
FILTER
DIRECT FIRED HEATER
COMBUSTER
NITRIC ACID TO STORAGE
NATURAL GAS
FILTER
ABSORBER PROCESS CONDENSATE COOLER
PROCESS CONDENSATE
CW
CW
NITRIC ACID PLANT

ATTACHMENT D

ADDITIONAL DATA SUBMITTED ON APRIL 9, 2003

DON PLANT TITLE V PERMIT

WORKING DRAFT – Item 2

New proposed Table 2.2 – TEST METHODS

J.R. Simplot Co.
Annual Stacking Testing

Stack Test Method Used

By Dennis Bowman

		Emission Tested									
Facility		SO2	H2SO4	NOx	PM	PM10	Fluoride	NH3	TRS	O2	VE (opacity)
300 Sulfuric	test Method #	8	8	7e	5	factor applied to PM				3a & 19	9
400 Sulfuric	test Method #	8	8								9
HPB&W Boiler	test Method #			7e						3a & 19	
Granulation I	test Method #				5	factor applied to PM	13	CMT 027			9
Granulation II	test Method #				5	factor applied to PM	13	CMT 028			9
Granulation III	test Method #				5	factor applied to PM	13				9
Reclaim Cooling Tower	test Method #				5	factor applied to PM	13		15a		9
Superphosphoric Acid	test Method #						13				9
Phosphoric Acid	test Method #				5	factor applied to PM	13				9
Ammonium Sulfate	test Method #				5	factor applied to PM					9

Also used are Methods 1, 2, 3, & 4.
Test Methods explanation ,
Method 1 - Sample & Velocity Traverses for Stationary Sources
Method 2 - Determination of Stack Gas Velocity & Volumetric Flow Rate
Method 3 - Gas Analysis for Carbon Dioxide, Oxygen, Excess Air, & Dry Molecular Weight.

Method 3a - Determination of Oxygen & Carbon Dioxide Concentrations In Emissions from Stationary Sources. (Instrumental Analyzer Procedure)
Method 4 - Determination of Moisture Content in Stack Gases.
Method 5 - Determination of Particulate Emissions From Stationary Sources.
Method 7e - Determination of Nitrogen Oxides Emissions From Stationary Sources (Instrumental Analyzer Procedure)
Method 8 - Determination of Sulfuric Acid Mist & Sulfur Dioxide Emissions From Stationary Sources.
Method 9 - Visual Determination of the Opacity of Emissions From Stationary Sources.
Method 13 - Determination of Total Fluoride Emissions from Stationary Sources (SPADNS Zirconium Lake Method)
Method 15 a - Determination of total Reduced Sulfur Emissions From Sulfur Recovery Plants In Petroleum Refineries.
Method CTM 028 - (Conditional Test Method for NH3)
Method 19 - Determination of Sulfur Dioxide Removal Efficiency & Particulate Matter, Sulfur Dioxide, & Nitrogen Oxides Emission Rates.

DON PLANT TITLE V PERMIT

WORKING DRAFT – Item 7

Parts of the facility are no longer in operation and granting of emission reduction credits.

Tier I Permits and Emission Reduction Credits

The J.R. Simplot Company recently shut down two emission sources within the Don Plant – the ammonia plant (#100 and #200) and the nitric acid plant. On September 25, 2002, the Don Plant sent a letter to the IDEQ Regional Office requesting that the emission reductions associated with these shutdowns be processed as emission reduction credits (ERCs) under the Idaho air quality regulations. The letter also requested that the Tier I permit and Operating Permit 077-00006 be revised to reflect these shutdowns and associated emission reductions.

The process for banking an ERC is set out in the regulations at IDAPA 58.01.01.460-461. To obtain credit for emissions reductions, "a permit to construct, Tier I operating permit, or Tier II operating permit shall be issued which establishes a new emissions standard for the facility, or restricts the operating rate, hours of operation..." IDAPA 58.01.01.460.04. Section 461.01 states that "the owner or operator of any facility may apply to the Department for a Tier I or Tier II operating permit (or a revision thereto) to bank an emission reduction credit." The September 25, 2002 letter serves this purpose.

Section 461.01 also sets out the Department's responsibility: "The Department may issue or revise such a Tier I or Tier II operating permit and a "Certificate of Ownership" for an emission reduction credit, provided that all emission reductions satisfy the requirements for emission reduction credits (Section 460)." The balance of this document describes how the emissions reductions from the ammonia plant and the nitric acid plant meet these requirements.

Section 58.01.01.460 outlines the requirements for an emission reduction to be credited in a Tier I operating permit (or a PTC or Tier II permit). In order to be credited, the emission reduction must satisfy five requirements. [Six are listed in subsection 460, but the last deals with mobile sources and is not applicable here.]

First, the proposed level of allowable emissions must be less than the actual emissions of the emission unit providing the emission reduction credit. In this case, the ammonia plant and the nitric acid plant have been shut down,

making the proposed level of allowable emissions equal to 0. The actual emissions of the ammonia plant and nitric acid plant thus would be eligible for credit. The levels of historical actual emissions from these now-defunct plants are detailed in an attachment to the letter of Leon Pruett to Mark Dietrich dated September 25, 2002.

Second, the timing of the emission reduction must meet the regulatory requirements. In an attainment area, any emission reduction that occurs prior to the minor source baseline date must have been banked prior to the minor source baseline date in order to be credited. In a nonattainment area, the emission reduction must occur after the base year of any control strategy for the particular air pollutant. The timing requirements appear to be met for each of the pollutants contained in the emission reduction chart attached to September 25, 2002 letter referenced above.

Third, the emission rate calculation must be appropriately done. The regulation requires that the emission rate before and after the reduction must be calculated using the same method and averaging time and the characteristics necessary to evaluate any future use of the emission reduction credit must be described. The information already submitted satisfies these requirements; if additional explanation or information is required, the company can provide it.

Fourth, a permit must be issued to establish a new emission standard for the facility or to restrict the operating rate, hours of operation, or the type of amount of material combusted, stored or process for the source or emission unit providing the emissions reductions. The Tier I operating permit is specifically designated to perform this function, as is a Tier II operating permit. In this instance, where the Don Plant has a Tier I permit pending appeal, DEQ can easily delete the substantive requirements included in the permit regarding the ammonia plant and the nitric acid plant and provide in the Tier I permit that these operations have been shut down in their entirety and are prohibited unless new source permitting review is performed prior to any future operation.

Fifth, the regulations state that emission reductions "imposed by local, state or federal regulations and permits" are not allowed to be used for emission reduction credits. The emission reductions here derive from business decisions regarding supply of certain materials, rather than by imposition of any regulatory or permitting requirement. Thus the emission reductions are eligible for ERC treatment.

Proposed Changes

Section 3

Summary Description
The No. 100 and No. 200 ammonia plants were shut down on _____(fill in date).

Operating Requirements
3.1 The No. 100 and No. 200 ammonia plants shall not be operated unless authorization has been granted by DEQ.

Section 11

Summary Description
The nitric acid plant was shut down on _____ (fill in date).

Operating Requirements
11.1 The nitric acid plant shall not be operated unless authorization has been granted by DEQ.

DON PLANT TITLE V PERMIT

WORKING DRAFT – Item 8

Permit Section	Facility	Parameter	Current Emission Limit	Proposed Emission Limit	Difference (Current - Proposed)	Basis for Emission Factor Change
4.5	Ammonium Sulfate	CO	0.07 lb/hr	0.16 lb/hr	0.09 lb/hr	
			0.3 T/yr	0.7 T/yr	0.4 T/yr	Emission factor change requested by DEQ. Updated AP-42 factors.
4.6		NOx	0.25 lb/hr	0.17 lb/hr	-0.08 lb/hr	
			1.1 T/yr	0.7 T/yr	-0.4 T/yr	
6.1	Babcock & Wilcox Boiler	PM	0.64 lb/hr	0.49 lb/hr	-0.15 lb/hr	
			2.79 T/yr	2.2 T/yr	-0.59 T/yr	
6.2		PM10	0.32 lb/hr	0.49 lb/hr	0.17 lb/hr	New boiler installed. More recent data used.
			1.4 T/yr	2.2 T/yr	0.8 T/yr	
6.6		VOC	0.19 lb/hr	0.36 lb/hr	0.17 lb/hr	
			0.84 T/yr	1.6 T/yr	0.76 T/yr	
7.4	Granulation I	NOx	1.44 lb/hr	2.5 lb/hr	1.06 lb/hr	
			6.3 T/yr	11 T/yr	4.7 T/yr	
7.5		CO	0.37 lb/hr	0.87 lb/hr	0.5 lb/hr	Emission factor change requested by DEQ. Updated AP-42 factors.
			1.6 T/yr	3.8 T/yr	2.2 T/yr	
7.6		SO2	0.004 lb/hr	0.009 lb/hr	0.005 lb/hr	
			0.019 T/yr	0.04 T/yr	0.021 T/yr	
8.4	Granulation II	NOx	1.69 lb/hr	1.8 lb/hr	0.11 lb/hr	
			7.4 T/yr	7.6 T/yr	0.2 T/yr	
8.5		CO	0.41 lb/hr	0.6 lb/hr	0.19 lb/hr	Emission factor change requested by DEQ. Updated AP-42 factors.
			1.8 T/yr	2.7 T/yr	0.9 T/yr	
8.6		SO2	0.0016 lb/hr	0.006 lb/hr	0.0044 lb/hr	
			0.007 T/yr	0.03 T/yr	0.023 T/yr	

ATTACHMENT E

COMPLIANCE TEST HISTORY

J.R. Simplot Company
Don Plant
Compliance Test Results

	Title V information (History for last 4 yrs)							
By D Bowman								
Plant	**Test Date**	**lb/hr PM-Dryer/Cooler**	**lb/ hr PM10 Factor used by permit-Dryer/ Cooler**	**Total PM10 for the two stacks lb/hr**	**Permitted PM10 Allowance**			
Ammonium Sulfate	5/15/02	0.40 / 0.22	0.33 / 0.18	0.51	2.0 lb/hr			
	1/11&12/2001	0.22 / 0.23	0.18 / 0.19	0.37				
	2/26&27/2000	0.34 / 0.21	0.28 / 0.17	0.45				
	2/23&25/1999	0.24 / 0.29	0.2 / 0.24	0.44				
Granulation I	**Test Date**	**lb/hr PM-Reactor / Dryer / Baghouse**	**lb/hr PM10 Factor used by permit-Reactor / Dryer / Baghouse**	**Total PM10 for the Three stacks lb/hr**	**Permitted PM10 Allowance**			
	4/2&3/2002	0.73 / 1.05 / 0.58	0.6 / 0.86 / 0.46	1.92	19.52 lb/hr			
	10/15-17/2001	0.5 / 4.63 / 0.21	0.41 / 3.80 / 0.17	4.38				
	8/23-9/5/2000	0.88 / 3.24 / 0.17	0.72 / 2.66 / 0.14	3.52				
	7/7-11/1999	0.41 / 1.9 / 0.21	0.34 / 1.56 / 0.17	2.07				
Granulation II	**Test Date**	**lb/hr PM- Tail Gas / Baghouse**	**lb/hr PM10 Factor used by Permit- Tail Gas / Baghouse**	**Total PM10 for the Two Stacks lb/hr**	**Permitted PM10 Allowance**			
	3/14/02	5.12 / 16.58	4.2 / 13.6	[redacted]	18.06lb/hr	[redacted]		
	12/5/01	3.72 / 0.39	3.05 / 0.32	3.37				
	1/12-2/4/2000	3.61 / 0.40	2.96 / 0.33	3.29				
	6/7&9/7/20&30/1999	1.82 / 0.93	1.49 / 0.76	2.26				
Granulation III	**Test Date**	**lb/hr PM-**	**lb/hr PM10 Factor used by Permit-**	**Total PM10 - lb/hr**	**Permitted PM10 Allowance**			
	9/17/02	1.89	1.54	1.54	5.7 lb/hr			
Phos Acid	**Test Date**	**lb/hr PM-**	**lb/hr PM10 Factor used by Permit-**	**Total PM10 - lb/hr**	**Permitted PM10 Allowance**			
	5/1/02	0.91	0.75	0.75	2.77 lb/hr			
	12/4/01	1.56	1.28	1.28				
	10/5&7/2000	1.01	0.83	0.83				
	8/31&9/9/1999	0.37	0.31	0.31				
300 Sulfuric	**Test Date**	**lb/hr PM-**	**lb/hr PM10 Factor used by Permit-**	**Total PM10 - lb/hr**	**Permitted PM10 Allowance**	**SO2 lb/hr / lb/ton**	**Permitted SO2 lb/hr / lb/ton**	
	11/6&7/2002	0.88	0.72	0.72	not determined	92.8 / 1.19	170 / 4	
	10/10-12/2001	0.045	0.037	0.037		129 / 1.85		
300 Sulfuric	**Test Date**	**H2SO4 lb/hr / lb/ton**	**Permitted H2SO4 lb/hr / lb/ton**	**NOX lb/hr / lb/ton**	**Permitted NOX / lb/ton**			
	11/6&7/2002	1.23 / 0.02	3 / 0.15	4.53 / 0.065	0.2 lb/ton			
	10/10-12/2001	0.61 / 0.0078		3.84 / 0.053				

J.R. Simplot Company
Don Plant
Compliance Test Results

400 Sulfuric	Test Date	lb/hr PM-	lb/hr PM10 Factor used by Permit-	Total PM10	Permitted PM10 Allowance	SO2 lb/hr / lb/ton	Permitted SO2 lb/hr / lb/ton	H2SO4 lb/hr / lb/ton
	2/26/02	na	na	na	na	209 / 3.1	333 / 4	1.7 / 0.01
	2/27&3/1/2002	na	na	na	na	317 / 3.3		7.8 / 0.08
	11/30&12/1&12/19/2000	na	na	na	na	312 / 3.2		7.0 / 0.07
	11/23-24/11/29&12/6/1999	na	na	na	na	319 / 3.4		3.9 / 0.04
400 Sulfuric	Test Date	H2SO4 lb/hr / lb/ton	Permitted H2SO4 lb/hr / lb/ton	NOX lb/hr / lb/ton	Permitted NOX / lb/ton			
	2/26/02	1.7 / 0.01	12.5 / 0.15	na	na			
	2/27&3/1/2002	7.8 / 0.08		na	na			
	11/30&12/1&12/19/2000	7.0 / 0.07		na	na			
	11/23-24/11/29&12/6/1999	3.9 / 0.04		na	na			
Cooling Towers	Test Date	lb/hr PM-	lb/hr PM10 Factor used by Permit-	Permitted PM10 Allowance	lb/hr Fluoride	Permitted Fluoride		
cells 2,5&7	8/20-22/2002	1.17 / 1.35 / 1.62	0.96 / 1.11 / 1.33	3.53 lbs/hr/cell	2.9 / 1.9 / 1.6	4.9 lbs/hr/cell		
cells 1,4&8	11/14-16/2001	1.21 / 1.05 / 0.98	0.99 / 0.86 / 0.8		4.5 / 3.3 / 1.7			
cells 2,5&7	8/3,7,8,10,14,&16/2000	1.7 / 2.5 / 1.2	1.37 / 2.05 / 0.96		2.2 / 4.1 / 4.1			
cells 3,6,&8	4/16,5/25,7/22 & 27,8/24,11/12 & 13/1999	1.9 / 1.0 / 1.1	1.56 / 0.84 / 0.92		2.3 / 2.5 / 1.1			

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1410 North Hilton • Boise, Idaho 83706-1255 • (208) 373-0502

Dirk Kempthorne, Governor
C. Stephen Allred, Director

April 8, 2004

Certified Mail No. 7000 1670 0013 8128 5283

Mr. Alan L. Prouty
Director, Environmental and Regulatory Affairs
J.R. Simplot Co.
P.O. Box 27
Boise, ID 83707-0027

RE: Facility ID No. 077-00006, J.R. Simplot Co., Pocatello
Final Tier I Operating Permit

Dear Mr. Prouty:

On April 5, 2004, your final modified Tier I operating permit was mailed to you. Inadvertently the Response to Public Comments package was omitted from the statement of basis. Enclosed you will find a replacement of the statement of basis with the missing response to public comments attached.

If you have any questions or concerns please contact me at (208) 373-0502 or pnair@deq.state.id.us.

Sincerely,

Pat Nair
Stationary Source Program Manager
Air Quality Division

PN/sd Permit No. T1-9507-114-1

Enclosures

c: Tiffany Floyd, Pocatello Regional Office
Laurie Kral, EPA Region 10

bc: Sherry Davis, Source File
Mike Simon, Permit Coordinator
Marilyn Seymore, Data Entry
Pat Rayne, AFS
Joan Lechtenberg, Public Comment
Pat Nair, Stationary Source Program Manager
Permit Binder
Phyllis Heitman (Ltr Only)
Reading File, (Ltr Only)

Statement of Basis

November 5, 2003

Tier I Operating Permit No. T1-9507-114-1

J.R. Simplot Company – Don Siding Plant

Pocatello, Idaho

Facility ID No. 077-00006

Prepared by:

Zach Klotovich, Environmental Engineer
Division of Technical Services

FINAL

TABLE OF CONTENTS

Acronyms, Units, And Chemical Nomenclature

acfm	actual cubic feet per minute
AFS	AIRS Facility Subsystem
AIRS	Aerometric Information Retrieval System
AQCR	Air Quality Control Region
ASTM	American Society for Testing and Materials
BACT	Best Available Control Technology
Btu	British thermal unit
CAA	Clean Air Act
CFR	Code of Federal Regulations
CO	carbon monoxide
DEQ	Department of Environmental Quality
dscf	dry standard cubic feet
EPA	U.S. Environmental Protection Agency
gpm	gallons per minute
gr	grain (1 lb = 7,000 grains)
HAPs	hazardous air pollutants
hp	horsepower
hr/day	hours per day
hr/yr	hours per year
IDAPA	a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
km	kilometer
lb/hr	pound per hour
MACT	Maximum Achievable Control Technology
MMBtu	million British thermal units
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO_X	nitrogen oxides
NSPS	New Source Performance Standards
O&M	operations and maintenance
PM	Particulate matter
PM_{10}	Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
ppm	parts per million
PSD	Prevention of Significant Deterioration
PTC	permit to construct
scf	standard cubic feet
SIC	Standard Industrial Classification
SO_2	sulfur dioxide
SO_x	sulfur oxides
T/day	tons per day
T/yr	tons per year
UTM	Universal Transverse Mercator
VOC	volatile organic compound

A. PURPOSE

The purpose of this Statement of Basis is to explain the legal and factual basis for the changes made to the Tier I operating permit issued on December 24, 2002, in response to the Petition for a Contested Case Proceeding, docket No. 0101-03-07, filed by the J.R. Simplot Company (Simplot) on January 28, 2003. This statement of basis is meant to satisfy the requirement to issue a technical memorandum in accordance with IDAPA 58.01.01.362.

B. SUMMARY OF J.R. SIMPLOT COMPANY'S SPECIFIC OBJECTIONS TO TERMS AND CONDITIONS OF THE TIER I PERMIT

The specific objections made by Simplot to the terms and conditions of the permit are summarized below and use the same nomenclature as the appeal to identify items. Attachments to this Statement of Basis include the appeal and prior technical memorandum issued with the permit on December 24, 2002. Changes were not made to the original technical memorandum, but it is attached for reference.

Item B.1

Simplot believes the Tier I Permit requires the use of inappropriate test methods for determining compliance with PM_{10} emission limits. Simplot notes that EPA Method 5 has been used in the past to measure and demonstrate compliance with the existing PM_{10} emissions limits and therefore use of Methods 201A and 202 for PM_{10} compliance amount to new substantive requirements. Simplot requests that DEQ remove all reference to EPA Methods 201A and 202 in Permit Condition 2.15 and Table 2.2.

Item B.2

Simplot requests that Permit Condition 2.15 and Table 2.2 identify all approved alternative test methods.

Item B.3

Simplot believes the requirements to monitor citizen complaints for fugitive emissions and odor are new applicable requirements. Simplot requests that Permit Conditions 2.3 and 2.6 be deleted.

Item B.4

Simplot believes weekly facility-wide inspections of fugitive dust and fugitive emissions are unnecessary. Simplot requests either the deletion of Permit Condition 2.4 or the frequency of inspection be reduced. Simplot requests that Permit Condition 2.8 be revised as follows:

- provide that Simplot must conduct facility-wide inspections of "potential point sources of visible emissions"
- revise to state that water vapor, nitrogen oxides, and chlorine gas are excluded from the see/no-see evaluation
- revise to exclude sources which are subject to source-specific visible emission inspection requirements (see 4.11.2, 7.18.3, 8.18.3, 9.17.1)
- revise to a less frequent monitoring schedule

Item B.5

Simplot believes repeating the full content of applicable rules is unnecessary and unreasonable. Simplot requests that the permit be revised to simply reference the excess emission, NSPS, and NESHAP requirements.

Item B.6

Simplot believes the general requirement in Permit Condition 2.23.1 to monitor and record throughput rates is vague and unreasonable. Simplot requests that Permit Condition 2.23.1 be deleted.

Item B.7

Simplot requests that requirements pertaining to emissions sources at the Don Plant that are no longer in operation be deleted from the permit. Simplot requests the deletion of Section 3 (no. 100 and no. 200 ammonia plants) and Section 11 (nitric acid and nitrogen solutions plants and associated handling facilities).

Item B.8

Simplot believes the Tier I permit prescribes erroneous emissions limits for numerous sources because emission factors have changed. Simplot requests the emission limits in Permit Conditions 4.5, 4.6, 6.1, 6.2, 6.6, 7.4, 7.5, 7.6, 8.4, 8.5, and 8.6 be revised to reflect more current AP-42 emission factors.

Item B.9

Simplot believes including process weight limits for PM emissions is unnecessary for many sources because pound per hour PM emission limits for those sources are more stringent than the process weight rate standard. Simplot requests language be added to Permit Conditions 4.2, 7.1.2, 14.1.2, 14.6.2, 16.3.2, and 17.4 stating that monitoring and compliance demonstrations with the process weight rate are not required. In addition, Simplot requests that Table 7.2 be revised to state that no monitoring and recordkeeping requirements are applicable to demonstrate compliance with Permit Condition 7.1.2.

Item B.10

Simplot believes monitoring requirements for emission control equipment are new substantive requirements.

a. Permit Conditions 4.15 and 4.16 require Simplot to install and maintain indicators which measure the fluid flow rate to the ammonium sulfate plant scrubber and monitor the pressure drop across each scrubber. The underlying applicable requirement from the 1999 operating permit requires Simplot to monitor these parameters "if needed." Simplot requests the conditions be revised to be consistent with the underlying applicable requirement and state that the monitoring of the parameters is required "if needed."

b. Permit Conditions 7.13 and 8.13 require Simplot to monitor the pressure drop across the baghouses for the granulation no. 1 process and the granulation no. 2 process. Simplot believes the conditions are new substantive requirements and should be deleted accordingly.

Item B.11

Simplot believes annual source testing to demonstrate compliance with PM/PM_{10}, SO_2, and NO_x emission limits is inappropriate and unreasonable.

a. Simplot believed the Tier I operating permit would include a tiered testing language which would dictate the frequency of compliance tests based on the percentage of the emissions standard measured during the initial compliance tests. Simplot requests that Permit Conditions 4.11.5, 7.18.4, 8.18.4, 9.17, 12.13.6, 14.8, 16.11.1, 16.11.2, 16.11.3, and 17.10 be revised to include the tiered testing language.

b. Simplot no longer operates the nitric acid plant and requests that Section 11, including requirement to conduct an annual performance test in Permit Condition 11.7.1, be removed from the permit.

Item B.12

Simplot believes the permit includes several conditions that are irrelevant and unnecessary at this time but that may become applicable in the future. See specifically Permit Conditions 9.24, 10.3-10.4.4. Simplot requests that inapplicable conditions be removed from the permit.

Item B.13

Permit Condition 14.4 of the permit states that liquid effluent from a wet scrubbing device installed to control emissions from process equipment cannot be introduced into an evaporative cooling tower. This requirement derives from 40 CFR § 63.602.(e). Simplot believes DEQ wrongly interprets this prohibition to include decanted water from the gypsum stack in Section 6.8.1 of the technical memorandum. Simplot requests the statement that "decanted water cannot be fed into the Reclaim Cooling Tower" be deleted from Section 6.8.1 of the technical memorandum.

Item B.14

Simplot believes there are several conditions in the permit that prescribe testing requirements that Simplot has already satisfied. Simplot requests Permit Conditions 11.7, 15.14, 15.15, 16.3.1, 16.11.1, 16.11.2, 16.11.3, 16.11.4, 16.11.5, and 16.14 be deleted from the permit. Alternatively, Simplot requests that DEQ add language to these conditions stating that Simplot has completed the requirements.

Item B.15

Pursuant to Permit Conditions 14.9-14.11, Simplot must continuously monitor the total inlet and total outlet streams to the reclaim cooling towers. Simplot believes this requirement encompasses an unapproved and arbitrary test protocol to demonstrate compliance. Simplot requests Permit Conditions 14.9-14.11 be deleted.

Item B.16

Simplot believes Permit Condition 16.2 requires continuous monitoring of sulfuric acid mist (H_2SO_4) emissions. The CEMS on the sulfuric acid plant no. 300 is not capable of monitoring H_2SO_4 continuously. Simplot requests Permit Condition 16.2 be revised to delete the reference to the 24-hour rolling average.

Item B.17

Simplot requests the production limit for the sulfuric acid plant no. 300 be revised from 1750 T/day to 1900 T/day.

Item B.18

Simplot notes that the no. 300 sulfuric acid plant stack is subject to two different opacity standards. Permit Condition 16.6 prescribes a 10% opacity limit as determined by EPA Method 9, while Permit Condition 16.7.1 sets forth a 20% limit to be determined by IDAPA 58.01.01.625. Simplot requests reconciliation of opacity requirements on the sulfuric acid plant.

Item B.19

Simplot believes Permit Condition 16.7.2 imposes a requirement on the control of fugitive emissions that is unenforceable. Specifically, the condition reads: "Visible fugitive emissions shall not be observed leaving the property boundary for a period or periods aggregating more than three minutes in any 60-minute period." Simplot requests Permit Condition 16.7.2 be deleted from the permit.

Item B.20

Simplot believes the requirements to monitor ambient concentrations of SO_2 (Permit Conditions 16.15 and 17.8.1) are obsolete. EPA required Simplot to monitor ambient SO_2 concentrations as part of Idaho's SO_2 control strategy for the Eastern Idaho Intrastate Air Quality Control Region. See 41 FR 23200 (June 9, 1976). During the time since Simplot began monitoring SO_2 concentrations the Eastern Idaho region was redesignated to attainment and permitted SO_2 emissions from the no. 300 sulfuric acid plant have been reduced from 2,190 lb/hr to 170 lb/hr. Simplot requests the monitoring requirements be removed from Permit Conditions 16.15 and 17.8.

Item B.21

The compliance schedule (Section 18) states that Simplot is in non-compliance with the Idaho air rules and requires Simplot to apply for and obtain a facility-wide Tier II operating permit to address the alleged non-compliance.

a. Simplot believes the language in the compliance schedule is not only erroneous but highly prejudicial and unreasonable. Simplot requests the language in Section 18 be modified to accurately represent the Don Plant's compliance status.

b. Simplot believes the SO_2 ambient monitoring requirements have been satisfied and requests the reference to non-compliance for ambient monitoring be stricken from Permit Condition 18.1.

c. Simplot believes a facility-wide Tier II operating permit for the Don Plant is not warranted and requests the requirement to apply for and obtain a facility-wide Tier II operating permit be removed from the permit.

Item B.22

Simplot believes they have identified miscellaneous errors in the Tier I permit and technical memorandum that should be corrected.

a. Simplot believes Permit Conditions 2.3, 7.11, 7.12, 8.1-8.12, and 12.4 are not required by federal law and should be labeled "state-only" conditions.

b. Simplot requests Permit Condition 2.23.3 be revised to state: "Ambient fluoride in vegetation <u>used for feed and forage</u> shall be monitored outside the Don Siding Complex at 15 different locations during the growing season." Simplot also requests that Table 2.1 and Section 5.1.16 of the technical memorandum be revised accordingly.

c. Simplot believes the requirement to develop operation and maintenance manuals for the wet scrubber system in the ammonium sulfate plant is a new substantive requirement and should be deleted from the permit.

d. The correct heat input for the HPB&W boiler (Section 5) is 175,000,000 Btu/hr.

e. Simplot believes the correct citation for Permit Condition 5.4 is 40 CFR 60.44b(a)(i).

f. Simplot believes Permit Condition 5.4 incorrectly states the requirements of 40 CFR § 63.624. The condition should state: "The owner/operator using a wet scrubbing emission control system must maintain daily averages of the pressure drop across each scrubber...."

g. Simplot requests the summary description in Section 9 (second paragraph) be revised to "*mono- or di-* calcium-phosphate product."

h. Simplot requests the third paragraph of the summary description in Section 9 be deleted. Simplot is not permitted to make diammonium and/or monoammonium phosphate through the introduction of ammonium and would have to undergo preconstruction review to do so.

i. Simplot requests Table 9.1 be updated to include the revisions requested in an October 16, 2002, email (Exhibit O).

j. Simplot requests Permit Condition 9.1.2 be revised to state that the granulation no. 3 process commenced operation on or after October 1, 1979. The granulation no. 3 process was modified pursuant to a PTC issued December 12, 2001.

k. Simplot requests Table 12.1 be updated to include the revisions requested during the public comment period (Exhibit O).

l. The heading in Section 14 should state "Direct Contact," rather than "Directed Contact."

C. SUMMARY OF REVIEW AND PROPOSED CHANGES

This section contains a review of each appeal item and a summary of the proposed changes to the permit.

Review of Item B.1

The Tier II operating permit issued December 3, 1999 specified the PM_{10} compliance determination method for the phosphoric acid plant, granulation no. 1 plant, granulation no. 2 plant, granulation no. 3 plant, and ammonium sulfate plant to be a U.S. EPA Reference Method 5 test result multiplied by a PM_{10}/PM conversion factor of 0.82. The reclaim cooling towers PM_{10} compliance determination method was a Method 5 test multiplied by a PM_{10}/PM conversion factor of 0.20[1]. It is apparent that the PM_{10} emissions limits were set using these conversion factors. DEQ recognizes that Methods 201A and 202 may result in a different measured emission rate than Method 5 and the conversion factor(s).

Because use of U.S. EPA Reference Methods 201A and 202 for determination of PM_{10} emissions is preferred but was not used to set the emissions limits, DEQ has developed a schedule to transition to a compliance determination using Methods 201A and 202. During calendar years 2004 and 2005 the compliance determination method will continue to be Method 5 and the conversion factor. In addition to the Method 5 testing conducted during calendar years 2004 and 2005, Simplot will conduct Method 201A and 202 tests. By September 30, 2005, Simplot will submit an application to revise the PM_{10} emissions limits in the Tier I and Tier II operating permits for the above mentioned sources that takes into account the results of the Method 201A and 202 tests. DEQ will then issue a revised Tier I operating permit with new PM_{10} emissions limits and include the Method 201A and 202 test methods as the compliance determination method.

[1] Tier II operating permit 077-00006 issued December 3, 1999, Appendix A, footnotes I and J.

Method 201A cannot be used on a wet stack. The methods for measuring PM_{10} emissions, Methods 201 and 201A, were promulgated on April 17, 1990 (55 FR 14246). The Environmental Protection Agency (EPA) stated in the preamble that "The PM_{10} methods are not recommended for stacks with entrained moisture droplets because water drops larger than PM_{10}, which are captured by the PM_{10} cyclone, may contain particles which normally would be counted as PM_{10}." Methods 201 and 201A are not applicable for in-stack PM_{10} measurement in stack gases containing water droplets. Where water droplets are known to exist in the emissions and when PM_{10} measurement is desired, EPA recommends that Method 5 (or a comparable method) be used and its particulate catch be considered as PM_{10} emissions (EMC TID-009). Therefore, on wet stacks, DEQ is requiring a Method 5 and 202 test be performed and the total catch considered PM_{10}.

Proposed Changes to Address Item B.1

Ammonium Sulfate Plant (Section 4)

The dryer and cooler are both controlled by wet scrubbers with wet stacks so a Method 5 and 202 test is required to determine PM_{10} emissions. Permit Condition 4.11 was revised.

Granulation No. 1 Process (Section 7)

The dryer and cooler are controlled by wet scrubbers so a Method 5 and 202 test is required to determine PM_{10} emissions. A Method 201A and 202 test is required on the cooler baghouse to determine PM_{10} emissions. Permit Condition 7.18.1 was revised.

Granulation No. 2 Process (Section 8)

The reactor, granulator, and dryer are controlled by the tailgas scrubber so a Method 5 and 202 test is required to determine PM_{10} emissions. A Method 201A and 202 test is required on the baghouse stack to determine PM_{10} emissions. Permit Condition 8.18.1 was revised.

Granulation No. 3 Process, East Bulking Station, and Defluorination Process (Section 9)

Emissions from the Entoleter scrubber and baghouse are ducted to one stack. Because the stack gas is wet, a Method 5 and 202 test is required to determine PM_{10} emissions. Permit Condition 9.17 was revised. The permit does not require a test of the diatomaceous earth baghouse.

Phosphoric Acid Manufacturing Plants (Section 12)

Emissions from the belt filter scrubber and digester scrubber are ducted to one stack, identified as the belt filter scrubber stack. Because the stack gas is wet, a Method 5 and 202 test is required to determine PM_{10} emissions. Permit Condition 12.13.1 was revised.

Reclaim Cooling Tower Cells (Section 14)

Emissions from the reclaim cooling towers are very wet, so a Method 5 and 202 test is required to determine PM_{10} emissions. Permit Condition 14.6.1 was revised.

No. 300 Sulfuric Acid Plant (Section 16)

Permit Condition 16.11.3 is taken directly from the PTC issued June 15, 2001, and has always required Methods 201A and 202 to measure PM_{10} emissions. No changes were made to the PM_{10} test methods. Permit Condition 16.3.1 states that "A source test will be required to determine the emission rate for PM_{10}." Test results were submitted in a report dated December 19, 2002 but an emissions limit has not been identified.

Review of Item B.2

Simplot submitted proposed test methods for each pollutant at each emissions unit and DEQ reviewed the proposed methods to determine if they were appropriate. See ATTACHMENT D, Item 2.

Proposed Changes to Address Item B.2

Table 2.2 was modified to include specific test methods for each emissions unit. DEQ made the following adjustments to the methods proposed by Simplot:

- specified Method 5 *and 202* should be used for PM
- specified use of Method 16a for total reduced sulfur (TRS) emissions from the phosphoric acid plant
- specified use of Method 13B for fluoride emissions
- specified use of conditional test method 027 (CTM 027) for ammonia emissions
- specified use of Method 10 for carbon monoxide emissions

Review of Item B.3

JRS has withdrawn their appeal of the requirement to monitor citizen complaints of fugitive dust and odor.

Proposed Changes to Address Item B.3

None

Review of Item B.4

a. Pocatello regional office staff had no record of problems with fugitive dust from the Don Plant.

b. Pocatello regional office staff had no record of problems with visible emissions from point sources at the Don Plant.

Proposed Changes to Address Item B.4

a. Visible emission inspection frequency in Permit Condition 2.8 was changed from weekly to monthly. The word "point" was also added to Permit Condition 2.8 to clarify that the monthly inspection is to be done on potential point sources of visible emissions.

b. Permit Condition 2.8 was not revised to state that water vapor, nitrogen oxides, and chlorine gas are excluded from the see/no see evaluation because Permit Condition 2.7 (which is also under the sub-header "Visible Emissions") contains the 20% opacity limit and specifically states that "these provisions shall not apply when the presence of uncombined water, nitrogen oxides, and/or chlorine gas is the only reason(s) for the failure of the emission to comply with the requirements of this section."

c. Permit Condition 2.8 was not revised to exclude the sources which are subject to source-specific visible emissions requirements. The facility-wide inspections in Permit Condition 2.8 are in addition to the source-specific monitoring requirements.

d. Fugitive dust inspection frequency in Permit Condition 2.4 was changed from weekly to monthly.

Review of Item B.5

One of the goals of the Title V permit program is to ensure that all applicable requirements are contained in the Title V permit. Appendices A and B of the permit contain provisions that apply to the Don Plant. The DEQ has reviewed these appendices with a view to removing redundant or non-applicable requirements. However, excising of certain portions would result in the remaining sections potentially being read and interpreted out of context.

Inclusion of the appendices in the permit provides for a more complete picture of requirements that apply to the facility, and so facilitate facility compliance as the requirements are in the permit instead of in a separate document. Additionally, the identification of these requirements provide DEQ inspectors and the public with a more complete list of applicable requirements.

Proposed Changes to Address Item B.5

The appendices and other lengthy permit conditions have not been altered as their existence not only is consistent with the Rules but also facilitates facility compliance.

Review of Item B.6

The general requirement to monitor and record throughput rates first appears in the December 18, 1989, Plant Expansion PSD operating permit on page 54 under Special Studies. Permit Condition 3.1 states "The permittee shall obtain and keep on file for two years the following process and equipment information: 3.1.3. The number of actual hours in each calendar year that each process operates. The throughput rates for each material flow direction and for each piece of process equipment." Permit Conditions 3.1.1 and 3.1.2 of the 1989 permit required Simplot to monitor and record silt content and moisture content for each incoming ore and dry product along with the drop heights of each material handling system transfer point. Therefore, it appears the point of the special studies section of the permit was to obtain information to determine emissions from material handling processes. In the August 29, 1994 operating permit, only the requirement to monitor hours of operation and throughput rates remained. The silt content, moisture content, and drop height monitoring requirements were not included. Because the original intent of the special studies section of the operating permit was to determine emissions from only the material handling processes, it does not make sense to include the requirement to monitor hours of operation and throughput rates for each material in the facility-wide requirements of the permit. Each significant source at the plant has its own section of the permit that contains adequate monitoring and recordkeeping to determine emissions.

Proposed Changes to Address Item B.6

Permit Condition 2.23.1 was removed from the permit because it is obsolete.

Review of Item B.7

The no. 100 and 200 ammonia plants and nitric acid plant discontinued operation in August, 2002.

Proposed Changes to Address Item B.7

The no. 100 and 200 ammonia plants (Section 3) and nitric acid plant (Section 11) were removed from the permit.

Review of Item B.8

The permit limits in the Tier I operating permit cannot be modified without first modifying the limits in the underlying permits (PTCs and Tier II) that are the basis of the Tier I requirements.

Proposed Changes to Address Item B.8

No changes were made to the permit. Simplot will address changing emissions limits through PTC or Tier II permit modifications.

Review of Item B.9

The process weight rate emissions limits for each process identified in the appeal were reviewed and compared with the existing hourly permit limits. Where the existing hourly permit limits are more stringent than the process weight rate standard the permit conditions were streamlined.

Proposed Changes to Address Item B.9

Permit Condition 4.2 – Ammonium sulfate - Process weight rate is an applicable requirement. Because the PM permit limit of 2.44 lb/hr (Permit Condition 4.1) is more restrictive than the process weight rate as explained in the tech memo, compliance with Permit Condition 4.1 shall be deemed compliance with Permit Condition 4.2 (process weight rate).

Permit Condition 7.1.2 – Granulation no. 1 - Process weight rate is an applicable requirement. Because the PM permit limit of 23.8 lb/hr (Permit Condition 7.1.1) is more restrictive than the process weight rate as explained in the tech memo, compliance with Permit Condition 7.1.1 shall be deemed compliance with Permit Condition 7.1.2 (process weight rate).

Permit Condition 14.1.2 – Cooling towers - According to JRS[2], the maximum process rate (flowrate) through the cumulative cooling tower cells is 30,000 gpm which equates approximately to a PWR of 7,500 tph.

$$(30{,}000 \text{ gpm}) * (1 \text{ ft}^3/7.48 \text{ gal}) * (62.4 \text{ lb/ft}^3) * (1 \text{ ton}/2000 \text{ lb}) * (60 \text{ min}/ 1 \text{ hr}) = 7{,}508 \text{ tph}$$

Dividing the total flow rate by the 8 cells gives a process weight of 938 tons per hour per cell. Using a PWR of 938 tph in the PWR equation for new equipment found in IDAPA 58.01.01.701, the allowable emissions are 40.7 lb/hr per cell. Because the PM permit limit of 17.65 lb/hr per cell (Permit Condition 14.1.1) is more restrictive than the process weight rate, compliance with Permit Condition 14.1.1 shall be deemed compliance with Permit Condition 14.1.2. Because Simplot is no longer required to demonstrate compliance with the PWR equation on a periodic basis Permit Condition 14.6.2 was also removed from the permit. Permit Condition 14.6.2 required Simplot to record the flow to the cooling tower and calculate the PWR limit using the equation that was in Permit Condition 14.1.2.

Permit Condition 16.3.2 – Sulfuric acid plant no. 300 - The permit has a PM_{10} emission limit, but not a PM emission limit. The PTC issued for the no. 300 sulfuric plant in 2001 required that initial performance testing include PM/PM_{10} emissions. Upon completion of that emission testing, PM/PM_{10} emission limits would be developed through discussions between DEQ and Simplot. Those discussions have not yet taken place. Therefore, PM/PM_{10} emission limits have not been developed for the no. 300 sulfuric acid plant and the process weight rate limitation is necessary.

Permit Condition 17.4 – Sulfuric acid plant no. 400 - The permit does not have a specific PM emission limit. Therefore the process weight rate limitation is necessary.

[2] Email attachment received May 30, 2003 from Alan Prouty

Review of Item B.10

a. Simplot has withdrawn their objection to Permit Conditions 4.15 and 4.16 that require the installation and maintenance of fluid flow rate and pressure drop monitors on the scrubbers.

b. Simplot has withdrawn their objection to Permit Conditions 7.13 and 8.13 that require monitoring of pressure drop across the baghouses on the granulation no. 1 and no. 2 processes.

Proposed Changes to Address Item B.10

None

Review of Item B.11

a. The Tier I permit conditions under appeal are summarized in Table 1 along with the existing test frequency from the underlying permits. The annual performance testing frequency was required in the existing permits for all emissions units except the granulation no. 3 plant.

TABLE 1. SOURCE TEST FREQUENCY

Permit Conditions	Condition Summary	Existing Test Frequency	Permit Limit	Summary of test results
4.11.	Ammonium sulfate dryer and cooler - PM and PM_{10} tests annually	PM_{10} –annually using Method 5 and 0.82 factor (Tier II No. 077-00006, 12/3/99)	PM – 2.44 lb/hr PM_{10} – 2.0 lb/hr (combined limit) (Tier II No. 077-00006)	See attached table from J.R. Simplot Co.
7.18.1	Granulation 1 process, dryer stack, R/G stack, baghouse stack – PM and PM_{10} tests annually	PM_{10} –annually using Method 5 and 0.82 factor (Tier II No. 077-00006, 12/3/99)	PM – 23.8 lb/hr PM_{10} – 19.52 lb/hr (combined limit) (Tier II No. 077-00006)	
8.18.1	Granulation 2 process, scrubber stack, baghouse stack – PM and PM_{10} tests annually	PM_{10} – annually using Method 5 and 0.82 factor (Tier II No. 077-00006, 12/3/99)	PM – 22.02 lb/hr PM_{10} – 18.06 lb/hr (combined limit) (Tier II No. 077-00006)	
9.17	Granulation 3 stack – PM, PM_{10} and fluoride tests	Initial performance test within 180 days of startup (PTC No. 077-00006, 12/12/01)	PM – 7.0 lb/hr PM_{10} – 5.7 lb/hr F – 1.28 lb/hr (PTC No. 077-00006, 12/12/01)	
12.13.1	Phosphoric acid plant – PM and PM_{10} tests annually	PM_{10} –annually using Method 5 and 0.82 factor (Tier II No. 077-00006, 12/3/99)	PM – 3.38 lb/hr PM_{10} – 2.77 lb/hr (Tier II No. 077-00006)	
14.8	Cooling tower cells – test 3 cells each year for PM, PM_{10}, and F	PM_{10} – annually using Method 5 and 0.2 factor F – annually (Tier II No. 077-00006, 12/3/99)	PM – 17.65 lb/hr per cell PM_{10} – 3.53 lb/hr per cell F – 4.9 lb/hr per cell (Tier II No. 077-00006, 12/3/99)	
16.11	No. 300 Sulfuric Acid			
16.11.1	SO_2 and H_2SO_4 annually	Initial performance test and annually thereafter (PTC No. 077-00006, 12/12/01)	SO_2 – 170 lb/hr H_2SO_4 – 3.0 lb/hr (PTC No. 077-00006, 6/15/01)	
16.11.2	NO_x annually	Initial performance test and annually thereafter (PTC No. 077-00006, 12/12/01)	64 T/yr (PTC No. 077-00006, 6/15/01)	
16.11.3	PM_{10} annually	Initial performance test and annually thereafter (PTC No. 077-00006, 12/12/01)	Based on source test. (PTC No. 077-00006, 6/15/01)	
17.10	No. 400 Sulfuric acid – SO_2 and H_2SO_4 annually	Annually using Method 8 (Tier II No. 077-00006, 12/3/99)	SO_2 – 999 lb/ 3-hour H_2SO_4 – 12.5 lb/hr (Tier II No. 077-00006, 12/3/99)	

b. The nitric acid plant was permanently shut down in August, 2002.

Proposed Changes to Address Item B.11

a. For those units that are required to test annually the test frequency cannot be changed in the Tier I permit until after the underlying permit condition is modified. The granulation no. 3 plant test frequency, Permit Condition 9.17.6, was not changed either because it already includes the tiered testing frequency consistent with other Tier I operating permits.

b. The nitric acid plant requirements have been removed from the permit.

Review of Item B.12

Permit Condition 9.23 required Simplot to keep a record of whenever ammonia was introduced to the granulation no. 3 process. This requirement was determined to not be necessary because Simplot is currently unable to introduce ammonia into the granulation no. 3 plant without physically changing the plant and would have to undergo preconstruction review prior to making the modification. Permit Condition 9.24 previously required Simplot to comply with 40 CFR 63 Subpart BB immediately upon the introduction of ammonia into the granulation no. 3 plant. Permit Condition 9.24 was revised to make it clear that Subpart BB is not currently applicable to the granulation no. 3 plant and that Simplot must notify DEQ prior to introducing ammonia to the plant.

DEQ verified that any and all gypsum stacks (piles) at the Don Plant are currently active (being used).

Proposed Changes to Address Item B.12

Permit Condition 9.23 was removed from the permit and Permit Condition 9.24 was revised to state the nonapplicability of 40 CFR 63, Subpart BB.

The requirements pertaining to inactive gypsum stacks in Section 10 of the permit were removed because all of Simplot's gypsum stacks are currently active. Changes to the permit consisted of removing the second part of Permit Condition 10.3, which had a Radon-222 emission limit for inactive stacks, and all of Permit Condition 10.4, which contained Radon-222 emission testing requirements for inactive stacks. Permit Condition 10.10 already required Simplot to notify DEQ immediately upon classifying a gypsum stack inactive and a note was added to the condition to make it clear that the Radon-222 emission limits in 40 CFR 61 Subpart R are applicable if the stack becomes inactive.

Review of Item B.13

Interpretation of permissible streams to the reclaim cooling tower shall be consistent with 40 CFR Part 63, Subpart AA and guidance related to this MACT.

Proposed Changes to Address Item B.13

In the Emissions Unit Description (Section 6.8.1) for the gypsum stacks/piles, the sentence "the decanted water cannot be fed to the Reclaim Cooling Tower" is withdrawn.

Review of Item B.14

Permit Condition 11.7 - This condition is an annual source test requirement for NO_x at the nitric acid plant (per Tier II). The nitric acid plant is no longer operational.

Permit Condition 15.14 - This condition is for an optional source test for NO_x from the SPA process to determine compliance with the emissions limit. The compliance demonstration method is from the December 3, 1999 Tier II operating permit, Appendix A, footnote K. Footnote K is referring to the pound per hour NO_x and CO emissions limits on the extended absorber scrubber and states, "As determined by a pollutant specific promulgated U.S. EPA Method, or DEQ-approved alternative, or as determined by DEQ's emission estimation methods used in the "Extended Absorption Scrubber" Permit to Construct (April 17, 1990) analysis." Simplot submitted NO_x test reports on August 26, 2003, for EPA Method 7 tests conducted January 17, 1991 and May 4, 1992 on the extended absorption scrubber (reports dated April 30, 1991 and July 30, 1992). The NO_x emissions limit is 0.10 lb/hr. Results of the January 17, 1991 test document an emissions rate of 0.052 lb NO_x/hr at a phosphoric acid feed rate of 190 gallons per minute. A noted deviation for this test was that due to the small stack diameter (3 inches) a conventional Method 1 velocity traverse could not be conducted and an electronic flow measuring device was used instead to determine stack velocity. Results of the May 4, 1992 test document an emission rate of 0.013 lb NO_x/hr at a phosphoric acid feed rate of 190 gallons per minute. Both tests demonstrated compliance with the emissions limit.

Permit Condition 15.15 - This condition is an optional source test for CO from the SPA process to determine compliance with the emissions limit. The condition states:

> "The permittee shall either conduct a compliance test to measure CO emissions from the SPA primary-control scrubber stack utilizing a pollutant-specific method promulgated by the EPA, a Department-approved alternative, or use the Department's emission estimation methods used in the analysis of the "Extended Absorption Scrubber," PTC No. 077-00006, dated April 17, 1990, to demonstrate compliance with the CO limit in Permit Condition 15.3."

Simplot submitted NO_x test reports on August 26, 2003, for tests conducted January 17, 1991 and May 2, 1992. The tests contained ORSAT data used to determine molecular weight of the stack gas, U.S. EPA Method 3, but did not have U.S. EPA Method 10 test results (pollutant-specific method). Simplot stated in the letter received August 16, 2003 that the ORSAT data implied that there were no CO emissions. Method 3 is applicable for the determination of carbon dioxide (CO_2) and oxygen (O_2) concentrations used to determine stack gas molecular weight. Method 10 is applicable for the determination of carbon monoxide emissions from stationary sources. Simplot has not yet provided data documenting that a pollutant-specific EPA Method test for the determination of CO emissions has been conducted on the SPA plant.

Permit Condition 16.3.1 - This condition is a one-time source test for PM_{10} at the no. 300 sulfuric acid plant (per June 15, 2001 PTC). The test was conducted and documented in a report dated December 9, 2002.

Permit Condition 16.11 - This condition requires annual source testing at the no. 300 sulfuric acid plant (per June 15, 2001 PTC) as follows:

16.11.1 for SO_2 and H_2SO_4,
16.11.2 for NO_x,
16.11.3 for PM_{10},
16.11.4 for NH_3, and
16.11.5 for opacity.

Tests were conducted December 2001 and November 2002. All tests demonstrated compliance. SO_2, NO_x, and NH_3, were all generally well below the allowable emission rate.

Permit Condition 16.14 – This condition clarifies that the results of the annual performance tests required in Permit Condition 16.11 must be submitted to DEQ within 30 days of conclusion of the tests.

Proposed Changes to Address Item B.14

Permit Condition 11.7 - Since the plant is no longer in service this condition was deleted.

Permit Condition 15.14 - A note was added to Permit Condition 15.2 stating that EPA Method 7 NO_x testing was conducted and documented in reports dated April 30, 1991 and July 30, 1992. Permit Condition 15.14 was removed.

Permit Condition 15.15 - The permit condition has been revised to require a compliance demonstration during calendar 2004.

Permit Condition 16.3.1 - A note was added to Permit Condition 16.3.1 to indicate that the test had been conducted and documented in a report dated December 9, 2002.

Permit Condition 16.11 - The requirement to conduct an initial performance test not later than 180 days after the plant modification was removed because the condition has been satisfied. Since the annual test requirement is per a PTC, Simplot needs to request to modify the PTC to reduce frequency of testing with justifications before the Tier I testing frequency can be changed.

Permit Condition 16.14 – This condition remains in the permit because it clarifies that the results of the annual performance tests required in Permit Condition 16.11 must be submitted to DEQ within 30 days of conclusion of the tests.

Review of Item B.15

This issue is still under review.

Proposed Changes to Address Item B.15

None.

Review of Item B.16

In order to address this appeal item, DEQ revisited the basis for the H_2SO_4 emissions limit and how compliance with the emissions limit is demonstrated. The basis of the H_2SO_4 emissions limit is at IDAPA 58.01.01.585. The acceptable ambient concentration (AAC) of sulfuric acid is 0.05 mg/m^3. The AACs in Section 585 are 24-hour averages and the permit specifies that the hourly sulfuric acid emission limit cannot be exceeded on a 24-hour average. To demonstrate compliance with the emissions limit the permit requires a performance test to demonstrate compliance with the hourly emission limit and then limits the corresponding sulfuric acid production rate to 120% of the rate achieved during the performance test calculated as a rolling 24-hour average. The production rate limitation is the surrogate parameter used to demonstrate compliance with the emissions limit. The permit does not require Simplot to monitor H_2SO_4 continuously. In reviewing the permit it was determined that Permit Condition 16.13 should be amended to require recording of the rolling 24-hour average production rate in addition to the hourly production rate to be consistent with the production limit.

Proposed Changes to Address Item B.16

Permit Condition 16.13 was amended to require recording of the rolling 24-hour average production rate in addition to the hourly production rate to be consistent with the production limit.

Review of Item B.17

Simplot has withdrawn their objection to this permit condition and may submit a separate PTC application in the future to increase no. 300 sulfuric acid plant production from 1750 T/day to 1900 T/day.

Proposed Changes to Address Item B.17

None

Review of Item B.18

Reconciliation of the opacity standards is not possible because IDAPA 58.01.01.625.04.c requires sources subject to New Source Performance Standards to calculate opacity as detailed in IDAPA 58.01.01.625.04 and as specified in 40 CFR Part 60.

Proposed Changes to Address Item B.18

None

Review of Item B.19

Permit Condition 16.7.2 requires that visible emissions not be observed leaving the property boundary for a period or periods aggregating no more than three minutes in any 60-minute period and that visible emissions be determined using EPA Reference Method 22. Permit Condition 2.4 adequately addresses the compliance demonstration for fugitive emissions. However, the condition comes from PTC No. 077-00006, issued June 15, 2001, for the no. 300 sulfuric acid plant so it cannot be removed from the Tier I permit until after it is removed from the PTC.

Proposed Changes to Address Item B.19

No changes were made to the Tier I permit at this time. Simplot will request a PTC modification to remove the condition.

Review of Item B.20

The ambient SO_2 monitoring conditions cannot be considered obsolete. The requirement to monitor ambient SO_2 concentrations exists in the federal regulations (40 CFR Part 52) and, consistent with correspondence between Simplot and EPA Region 10, additional SIP actions are required to remove these conditions. However, the DEQ understands that the Don Siding Plant currently operates two monitoring stations instead of the four required under 40 CFR 52.675. The original Tier I permit specifies, in the compliance schedule, the actions necessary on the part of Simplot to work towards removal of these requirements and resolution of this issue.

Proposed Changes to Address Item B.20

No changes were made to the Tier I permit.

Review of Item B.21

a. The DEQ reviewed the language used in Section 18 (Compliance Schedule) of the permit and found that it was not consistent with language used in other Tier I compliance schedules.

b. The DEQ understands that the Don Siding Plant currently operates two monitoring stations instead of the four required under 40 CFR 52.675 so this item remains in the compliance schedule.

c. The DEQ has reviewed the issues identified in the compliance schedule and has determined that a Tier II operating permit will not remedy the compliance issues. The ambient fluoride standard is being addressed through a consent order and the ambient monitoring of SO_2 will be addressed through a SIP revision.

Proposed Changes to Address Item B.21

a. The language in Section 18 has been revised and is consistent with the language used in other Tier I permits.

b. No changes were made to the Tier I operating permit.

c. The requirement to apply for and obtain a Tier II operating permit has been removed from the permit.

Review of Item B.22

a. All conditions identified in the appeal (Permit Conditions 2.3, 7.11, 7.12, 8.1-8.12, and 12.4) are either from a Tier II operating permit developed in accordance with federally approved rules or are monitoring requirements to ensure compliance with federally approved rules.

Permit conditions from the Tier II operating permit: 7.11, 7.12, 8.1.1, 8.2, 8.3.1, 8.4, 8.5, 8.6, 8.7, 8.8, 8.9, 8.11, 8.12, 12.4

Permit conditions from the IDAPA air rules: 2.3, 8.1.2, 8.3.2, 8.7, 8.8, 8.9, and 8.10

Proposed change

All of the requirements are federally enforceable and no changes were made to the permit.

b. The ambient fluoride standard is contained in IDAPA 58.01.01.577.06. "Primary and secondary air quality standards are those concentrations in the ambient air which result in a total fluoride content in vegetation *used for feed and forage* of no more than:..."

Proposed change

The requested changes were made. Permit Conditions 2.23.2 and 2.24 as well as Table 2.1 were revised to clarify that Simplot must monitor the total fluoride content in vegetation used for feed and forage which is consistent with the ambient fluoride standard in IDAPA 58.01.01.577.06.

c. Simplot has withdrawn their objection to this permit condition.

Proposed Change

None.

d. The DEQ reviewed the Tier I application materials and concurs with Simplot that the correct heat input rating for the HPB&W Boiler is 175,000,000 Btu/hr.

Proposed Change

The heat input rating was corrected in the summary description of the HPB&W Boiler (Section 5).

e. The DEQ reviewed the NSPS and concurs with Simplot that the correct citation for the NO_x emission limit in Permit Condition 5.4 is 40 CFR 60.44b(a)(1).

Proposed Change

The citation was corrected.

f. The DEQ reviewed the requirements of 40 CFR 63.624 and concurs that Simplot must maintain the daily *average* of the pressure drop across each scrubber.

Proposed Change

The word "averages" was added to Permit Condition 7.10. "[T]he owner/operator using a wet scrubbing emission control system must maintain daily averages of the pressure drop across each scrubber."

g. Simplot requested the summary description in Section 9 (second paragraph) be revised to "mono- or di- calcium phosphate product." Simplot commented on the description during the public comment period stating the description should be "mono- or di- phosphate products. Do not include calcium phosphate products." Simplot later submitted this clarification to the summary description in Section 9: "Calcium should be included. The statement during the public comment period is not correct. The intent was to identify the manufacture of "mono" and "di" calcium phosphate products and exclude the manufacture of ammonia products at Granulation III. The Summary Description contained in the Title V permit on page 47 is correct except for changing "bi" products to "di" products..."

Proposed Change

The requested change was made to the summary description in Section 9 so that it now reads "mono- or di-calcium-phosphate product...."

h. The summary description of Section 9 (third paragraph) stated that the granulation no. 3 process "was capable of making diammonium and/or monoammonium phosphate by introducing ammonium into the process." Simplot is not permitted to make diammonium and/or monoammonium phosphate products through the introduction of ammonium and would have to undergo preconstruction review to do so.

Proposed Change

The third paragraph of the summary description in Section 9 was changed to read, "The Granulation No. 3 process is not capable of making diammonium and/or monoammonium phosphate by introducing ammonia into the process."

i. The DEQ compared the Table 9.1 submitted in Exhibit O of the appeal to the Table 9.1 in the permit and noted the requested changes in the Exhibit O.

Proposed Change

Table 9.1 in the permit was updated as requested in Exhibit O.

j. The granulation no. 3 process was modified in 2001 so the applicable process weight rate equation is in IDAPA 58.01.01.701 for processes commencing operation on or after October 1, 1979.

Proposed Change

Table 9.2 and Permit Condition 9.1.2 were updated accordingly.

k. The DEQ compared Table 12.1 in the permit to the Table 12.1 provided in Exhibit O and did not find any differences in the tables.

Proposed Change

No changes were made to Table 12.1.

l. The DEQ reviewed the heading in Section 14 (Reclaim Cooling Tower Cells) and concurs that it should read "Direct Contact" rather than "Directed Contact."

Proposed Change

The heading was revised.

References Cited

EMC TID-009 (Emission Measurement Center Technical Information Document-009), Environmental Protection Agency, September 9, 1991. http://www.epa.gov/ttn/emc/informd.html, accessed 9/19/03.

ATTACHMENT F

RESPONSE TO PUBLIC COMMENTS
ON THE PROPOSED TIER I OPERATING PERMIT FOR THE
J. R. SIMPLOT COMPANY – DON PLANT, POCATELLO, IDAHO

January 26, 2004

STATE OF IDAHO
DEPARTMENT OF ENVIRONMENTAL QUALITY
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Introduction

As required by IDAPA 58.01.01.364 of the Rules for the Control of Air Pollution in Idaho (Rules), the Idaho Department of Environmental Quality (DEQ) provided for public notice and comment on the proposed Tier I operating permit for the J. R. Simplot Company – Don Plant located near Pocatello, Idaho. Public comment packages, which included the Tier I permit appeal, the revised permit, and associated technical memoranda, were made available for public review at the Marshall Public Library in Pocatello, and DEQ's state office in Boise and regional office in Pocatello. The public comment period was provided from November 17, 2003 through December 18, 2003. Written comments were received. Those comments regarding the air quality aspects of the permit are paraphrased below with DEQ's response immediately following.

Public Comments and DEQ Responses

A summary of the comment received from the Mayor of Pocatello on November 25, 2003 is provided below:

Comment 1: The Mayor of Pocatello, Roger W. Chase, expressed support for the continued operation of the Don Plant.

Responses to the comments received from the J. R. Simplot Company on December 18, 2003 are provided below:

Comment 2: **Page no. 144 appears on each page of the draft permit. This error needs to be corrected prior to issuing the final permit.**

Response to 2: The page numbers were corrected.

Comment 3: **With the issuance of a new operating permit, the expiration date should be 5 years from the date of issuance of the new permit.**

Response to 3: A modified or amended Tier I permit does not constitute a renewed Tier I permit. The expiration date of the permit is not changed until the permit is reissued upon full review of a renewal application that evaluates all applicable requirements. The permit expiration date was not changed.

Comment 4: **The weekly visible emissions inspection required at permit condition 15.11 and referenced in permit condition 15.16 is more restrictive than the visible emission inspection requirements for the other facilities. There are no underlying permits or regulations that require weekly visible emissions inspections of this facility. The visible emissions inspection frequency should be changed from weekly to monthly at permit condition 15.11 and referenced at permit condition 15.16.**

Response to 4: This permit action only addresses issues raised in the permit appeal dated January 28, 2003, and as agreed to by DEQ and JR Simplot Co. in the settlement agreement. Permit conditions 15.11 and 15.16 were not addressed in the appeal and are not part of this permit action. Therefore, DEQ will not address the comment at this time because the conditions were not part of the permit action out for public comment. DEQ will consider changes to the permit conditions as part of a separate permit action – initiated by submittal of a permit application.

Comment 5: **Table 2.2 contains test methods that are currently used at J. R. Simplot Co., Don Plant. As written, permit condition 2.15 and Table 2.2 do not allow any latitude in the test methods that can be used.**

Response to 5: The changes requested in the comment do not reflect the resolution of the appeal item as agreed to by Simplot and DEQ. Simplot submitted a revised Table 2.2 with proposed test methods as part of the appeal (see Attachment D, item 2, of the public comment package) that DEQ substantially accepted with a few changes. DEQ has determined that the test methods in the table are appropriate for the individual sources. It is preferable to identify the test method to be used for each pollutant at each source in the permit rather than wait until a protocol is submitted. This speeds protocol approval and helps to maintain consistency in annual testing. A source should not be tested with varying methods from year to year because it makes test results difficult to compare. DEQ carefully reviewed the appropriate test methods for individual emission sources when responding to the appeal and other test methods should not be used unless approved by DEQ.

Comment 6: **Actual sulfur content in percent by weight for each shipment of distillate fuel oil received is not available from the supplier. The supplier can provide documentation stating the maximum allowable sulfur content the distribution facility will provide the supplier. Permit condition 2.19 needs to be modified to state that documentation of sulfur content in percent by weight for distillate fuel oil received will be kept at the facility.**

Response to 6: This permit action only addresses issues raised in the permit appeal dated January 28, 2003, and as agreed to by DEQ and JR Simplot Co. in the settlement agreement. Permit condition 2.19 was not addressed in the appeal and is not part of this permit action. Therefore, DEQ will not address the comment at this time because the condition was not part of the permit action out for public comment. DEQ will consider changes to the permit condition as part of a separate permit action – initiated by submittal of a permit application.

Comment 7: **Final sentence of Ammonium Sulfate summary description should include rail car loading. It should read – "The bucket elevator chute feeds product into trucks *and rail cars.*"**

Response to 7: The Ammonium Sulfate summary description was not addressed in the appeal. The permit action out for public comment addresses only changes made to the Tier I operating permit as a result of the appeal dated January 28, 2003, and as agreed to by DEQ and JR Simplot

Coo. In the settlement agreement. Because the summary description was not part of the permit action out for public comment DEQ will not address the comment at this time. DEQ will consider changes to the description as part of a separate permit action – initiated by submittal of a permit application.

Comment 8: **Emission factors are used to calculate emissions. For several of the facilities, the emission factor used to determine emissions is different than the emission factor used to determine emission limits. The underlying permit will require modification to address this item. The following facilities require the emission factor and/or the emission limit to be modified:**

Ammonium Sulfate – Tier II permit modification

Permit condition 4.12.2: AP-42 emission factors are to be used to determine emissions for SO_2, NO_x, and CO. AP-42 emission factors were not used to establish emission limits. Use of current AP-42 emission factors results in apparent non-compliance.

Permit condition 4.13: Fugitive dust (PM_{10}) emission limits based on 1986 permit limits. Compliance based on June 2002 application data.

Permit condition 4.14: Fugitive dust (PM_{10}) emission limits based on 1986 permit limits. Compliance based on June 2002 application data.

HPB&W Boiler – PTC modification

Permit condition 5.20: This permit condition requires the use of AP-42 emission factors to determine emissions of CO and NO_x. Emission limits are actually based on emission factors identified in the PTC application. These emission factors are not AP-42 factors. They are vendor supplied factors. Use of current AP-42 emission factors results in apparent non-compliance.

B&W Boiler – Tier II permit modification

Permit condition 6.12: This permit condition requires the use of current AP-42 emission factors to determine emissions for CO, NO_x, and SO_2. Use of maximum operating hours (8760 hrs) and Title V specified emission factors generates emissions that exceed emission limits.

Granulation I – Tier II permit modification

Permit condition 7.21: This permit condition requires the use of current AP-42 emission factors to determine emissions for CO, NO_x, and SO_2. Use of maximum operating hours (8760 hrs) and Title V specified emission factors generates emissions that exceed emission limits.

Granulation II – Tier II permit modification

Permit condition 8.21: This permit condition requires the use of current AP-42 emission factors to determine emissions for CO, NO_x, and SO_2. Use of maximum operating hours (8760 hrs) and Title V specified emission factors generates emissions that exceed emission limits.

Granulation II – Tier II permit modification

Permit condition 8.22: Fugitive dust (PM_{10}) emission limits based on 1986 permit limits. Compliance based on June 2000 application data.

Gypsum Stack – Permit modification

Permit condition 10.9: Emission limits based on 1986 emission factors. Compliance determined with June 2000 application data.

No. 400 Phosphoric acid plant – Permit modification

Permit condition 12.5: Fugitive dust (PM_{10}) emission limits based on 1986 permit. Compliance determined with 2000 application emission factors.

Plant roads – Permit modification

Permit conditions 13.1 and 13.2: Fugitive dust (PM_{10} and PM) emission limits based on 1986 permit. Compliance determined with 2000 application emission factors.

Response to 8: DEQ agrees that the changes need to be addressed through a request to modify the underlying permit conditions. The request should include a description of the changes to be made to each emission limit or emission factor. The description should specify the exact emission limit or emission factor to be used and should include an explanation of why the revised limit or factor is more appropriate than the existing limit or factor.

Comment 9: **Permit condition 8.1.2 should be similar to permit condition 7.1.2. Permit condition 7.1.2 states: "Based on the process rate equation the limit is 25.6 lb/hr. Because permit condition 7.1.1 is more stringent, compliance with permit condition 7.1.1 shall be deemed compliance with permit condition 7.1.2.**

Response to 9: This permit action only addresses issues raised in the permit appeal dated January 28, 2003, and as agreed to by DEQ and JR Simplot Co. in the settlement agreement. Permit condition 8.1.2 was not addressed in the appeal and is not part of this permit action. Therefore, DEQ will not address the comment at this time because the condition was not part of the permit action out for public comment. DEQ will consider changes to the permit condition as part of a separate permit action – initiated by submittal of a permit application.

Comment 10: **Permit conditions 14.9.1-14.9.3 state that the total inlet and total outlet streams must be continuously monitored to determine fluoride, PM, and PM_{10} emissions from the Reclaim Cooling Towers. This is an appeal item that DEQ and Simplot are negotiating to resolve. This is a significant change from the current standard.**

Response to 10: DEQ agrees that monitoring of cooling tower process data is an item that DEQ plans to discuss further with Simplot with the intent to resolve. Further information regarding the operation and/or design of the cooling tower may be needed.

Comment 11: **Permit condition 14.10 states the permittee shall identify the entire flow path of all scrubber output and submit it to the Department on or before the issuance date of the permit. This requirement has been satisfied.**

Response to 11: DEQ agrees that an overview of the flow path of scrubber fluid has been submitted. This issue is still under review by DEQ. Additional material may be needed to address the appropriate monitoring of the reclaim cooling towers.